DOCUMENT RESUME

ED 109 009 SO 008 432

AUTHOR	Calef, Wesley; And Others
TITLE	New Approaches in Introductory College Geography Courses, Publication No. 4.
INSTITUTION	Association of American Geographers, Washington, D.C. Commission on College Geography.
SPONS AGENCY	National Science Foundation, Washington, D.C.
PUB DATE	67
NOTE	181p.
EDRS PRICE	MF-$0.76 HC-$9.51 PLUS POSTAGE
DESCRIPTORS	*Course Descriptions; Curriculum Development; Curriculum Guides; Geographic Concepts; *Geography; *Geography Instruction; Higher Education; Human Geography; Physical Geography; Problem Solving; *Social Sciences; World Geography

ABSTRACT

As part of a program to improve college and university training geography, this book contains four course outlines developed by members of the Commission on College Geography of the Association of American Geographers. "A Proposal for a New Geography Course for Liberal Education: Introduction to Geographic Behavior" is an introductory course to basic geographic concepts that emphasizes active student problem solving rather than lectures. "The World Regional Geography Course: Alternative Approaches" is a two-semester course focusing on global geographical processes that uses the lecture-discussion teaching approach. "Introduction to Geography -- A Spatial Approach, A One-Semester Course Outline" studies the locations, distributions and spatial associations of natural and cultural phenomena through a student problem-solving approach. "Introduction to the Study of Geography" is a lecture-oriented course designed for non-majors. Each of the course outlines contains suggested student readings. (Author/DE)

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COMMISSION ON COLLEGE GEOGRAPHY

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ASSOCIATION OF AMERICAN GEOGRAPHERS
Washington, D. C. 20036

1967

Supported by a grant from the National Science Foundation

ASSOCIATION OF AMERICAN GEOGRAPHERS
Commission on College Geography Publications

- No. 1—Geography in Undergraduate Liberal Education, 1965
- No. 2—A Basic Geographical Library—A Selected and Annotated Book List for American Colleges, 1966
- No. 3—Geographic Manpower—A Report on Manpower in American Geography, 1966
- No. 4—New Approaches in Introductory College Geography Courses, 1967

New Approaches In Introductory College Geography Courses

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Commission on College Geography
Washington, D. C. 20036

PUBLICATION No. 4

Library of Congress Catalog Card Number 67-26421

Supported by a grant from the National Science Foundation

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FOREWORD

In January of 1965, the Association of American Geographers established the Commission on College Geography. Supported by a succession of grants from the National Science Foundation, the Commission has pursued its aim of improving the level and quality of college and university training in Geography via a variety of undertakings. Central to all of these efforts is the question, "What kind of Geography should be taught in America's institutions of higher education?". The supporting materials, the instructional strategies, the sequence and objectives of training programs are relevant only within the context of a specific philosophy of Geography.

From its inception, the Commission has taken the position that there is no single kind of Geography that can and should be taught at the college level. The richness of traditions that range from man-land relationships, to areal variation, to spatial distributions—the variety of approaches, from empiric-inductive to theoretical-deductive, from "cartophilic" to quantitative, from field inquiry to primary documents analysis—the breadth of interest in the physical and human processes that shape the man-natural environment system, these are all Geography's strength. A central purpose of the Commission is to enlist individuals of differing viewpoints in the task of defining and articulating modern Geography as a university field. Intellectual challenge and defensible methodology are the tests of the "kind of Geography" that should be taught, not conformance to one particular point of view.

Because the Commission holds this philosophy, it rejects "the model course notion" as a modus operandi. In its concern with introductory College Geography, it is pursuing the strategy of encouraging numbers of talented individuals to develop course outline syllabi. The first such four are included in this publication. Others are in progress. These outlines are purely experimental; they are in the process of being tested by their authors in the classroom. More importantly, they are being distributed widely within and without the geographical profession in the hope that they will stimulate inquiry, reaction and emulation.

The Commission is indebted to Wesley Calef, Ann Larimore Kolars, Robert B. McNee and Kennard W. Rumage for their valued contributions. They have shared their ideas freely with members of the Commission and have been unstinting in their application of time and intellectual energies in the process of improving introductory College Geography.

—Saul B. Cohen, Chairman
Commission on College Geography

A PROPOSAL FOR A NEW GEOGRAPHY COURSE FOR LIBERAL EDUCATION: INTRODUCTION TO GEOGRAPHIC BEHAVIOR

Robert B. McNee
University of Cincinnati

Page

Preface vii

Introduction 1

Part I. Lecture-demonstration vs. Problem-solving. 2

Part II. The Structure of Geography 4
- Central Research Questions 5
- The Geographic Value System 8
- Methods and Techniques 11
- Geographic Vocabulary and Organizing Concepts 11
- The Structure of Geography: A Summary 13

Part III. Relating the Structure of Geography to Liberal Education and Teaching Strategy. 13
- The Relation of the Geographic Value System to General Social Values 13
- Methods and Techniques 14
- Geographic Vocabulary and Organizing Concepts 14
- The Four Clusters of Research Questions. 15
- Relating the Structure of Geography to the Aims of Liberal Education and Teaching Strategy: Conclusions 17

Part IV. The Institutional Setting for the Course 18

Part V. Course Design 19
- A. Introduction: The City Region 20
- B. The Geography of Production. 23
- C. Spatial Production Systems in Historical-Cultural Context 26
- D. Spatial Production Systems in the Context of Political Territorialism. 28
- E. The Earth as Modified and Modifiable by Human Action 29
- F. Some Unanswered Questions about Human Geographic Behavior 30
- G. Selected References for Implementing the Course Design 31
  - General References. 31
  - Part I. The City Region 32
  - Part II. The Geography of Production. 33
  - Part III. Spatial Production Systems in Historical Cultural Context 35
  - Part IV. Spatial Production Systems in the Context of Political Territorialism. 36
  - Part V. The Earth as Modified and Modifiable by Human Action. 37

PREFACE

Many experiences in the last few years have influenced my thinking and hence this report. I have gained from study of the report of the Geography and Liberal Education Committee[1] and from participation in meetings of the committee. The Commission on COLLEGE Geography was a direct outgrowth of that committee and it is the funding agency for this report. The activities and publications of the High School Geography Project were very helpful, too. As a consultant for that project during 1962-63, and as a member of the Steering Committee for the Project thereafter (1963-67), I absorbed many ideas about both geography and liberal education of benefit at any educational level. During the summer of 1964, I attempted to set down preliminary thoughts about what innovations might be possible at the college level, sharpening my views through conversations with Laurence G. Wolf. This attempt I used as raw material in the development of a tentative outline for the High School Geography Project during 1964-65. That outline, after extensive revisions through suggestions from various geographers associated with the High School Geography Project, will soon be published along with other outlines developed by the project. It is being used to guide the development of the first full course to be produced by the project. Currently, this course is called "Geography in an Urban Age." Feedback, as I have observed the course taking shape, has been invaluable in thinking about possibilities at the college level. The effort to understand the other outlines being published by the project, and the thinking which lies behind them, has sharpened my thinking about geography and the purposes of liberal education. Likewise, I gained immeasurably from participation in a conference of curriculum specialists of many disciplines held at Purdue University in January, 1966, as a representative of the High School Geography Project.[2] Further opportunity to develop my ideas and to subject them to the criticism of my peers came in the summer of 1966, at the Institute on College Geography held at the Ohio State University, sponsored by the Commission on College Geography and funded by the National Science Foundation. Sharing ideas with other geographers while serving as a consultant to the U.S. Office of Education in recent years has been a help as well. Both faculty and students at the University of Cincinnati have helped with comments and good will.

Of all these influences on my thinking, I believe the most important were the meetings of the Geography and Liberal Education Committee and the Steering Committee of the High School Geography Project. The open and often heated discussion among men of such stature inspired me. If the full proceedings of both committees had been recorded in detail, I think one would find there all of the ideas, or nearly all of the ideas, presented in this report. No doubt such ideas would appear in differing order and with differing frequency and intensity than in this report, but nevertheless they would be there. In short, I owe a great debt to the whole profession for the many opportunities recorded here, but especially to the men of those committees for giving so freely of themselves. If this report does not accurately reflect the current thinking of the profession, and I am aware that my own biases prevent this in certain cases, it has not been for lack of opportunity to learn from fellow geographers.

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[1] Geography and Liberal Education Committee, Geography in Undergraduate Liberal Education (Washington, D.C.: Association of American Geographers, 1965).

[2] Irving Morrissett (ed.), Concepts and Structure in the New Social Science Curricula (West Lafayette, Indiana: Social Science Education Consortium, Inc., 1966), 167 pp.

Many people have read and criticized this report and the report has been substantially altered as a result. I particularly wish to record the assistance of the following:

Dr. Edward J. Shoben, Jr., formerly Director of the Center for Research and Training in Higher Education, University of Cincinnati, and currently Director of Commission on Academic Affairs, American Council on Education, Washington, D.C.
Dr. Joseph Velikonja, Department of Geography, University of Washington
Dr. Edward Taaffe, Department of Geography, The Ohio State University
Mr. Peter Halvorson, Department of Geography, University of Cincinnati
Dr. Saul B. Cohen, Department of Geography, Clark University
Dr. William D. Pattison, Department of Geography, University of Chicago
Dr. Erich Isaac, Department of Economics, City College of New York
Dr. Laurence G. Wolf, Department of Geography, University of Cincinnati
Dr. W. A. Douglas Jackson, Department of Geography, University of Washington
Dr. Homer Aschmann, Department of Geography, University of California, Riverside
Dr. Wilbur Zelinsky, Department of Geography, The Pennsylvania State University
Miss Dorothy Sonntag, Department of Geography, University of Cincinnati

A PROPOSAL FOR A
NEW GEOGRAPHY COURSE FOR LIBERAL EDUCATION:
INTRODUCTION TO GEOGRAPHIC BEHAVIOR

Introduction

The purpose of this report is to present a reasoned, coherent, course design which is consistent with the aims of general education, with current thinking about the nature of the learning process, and with the nature of contemporary geography as an on-going community of scholarship.

The nature of liberal education and the relation of geography to it is admirably discussed in the report of the Geography and Liberal Education Committee; therefore, I see little point in belaboring the issue here. Suffice to say that I believe such education should be both liberal and general. By liberal, I mean that it should be liberating to the student. It should free the student's mind from shackling preconceptions and lure it in new directions. It should shake habitual thought patterns and puzzle the mind through the introduction of new ideas and problems. In short, it should stimulate intellectual growth. By general, I mean that it should focus on questions of concern to most thinking men today, questions which are relevant to most of us as life is lived in the mid-Twentieth Century and not questions which excite the specialist only. It need not concern itself particularly with "what every educated man should know" but it most certainly should concern itself with the kinds of questions thinking men generally are asking today. The number of such questions, their sequence, and the relative emphasis given to each is much less important than that the questions themselves be of general significance or relevance and that the questions be probed sufficiently to give depth as well as breadth to the course. In short, I believe that liberal or general education should stimulate intellectual growth and that it should be relevant to life as it is lived and will be lived by the student.

The organization of this report reflects my current value system. Part I, Lecture-demonstration versus Problem-solving, considers the question of basic course design. A much more conventional approach is to begin with a description of what is to be taught and then, as a subsidiary matter, take up the question of how it is to be taught. I have inverted this, taking up the how question before the what question. There are two major reasons for this ordering. First, I believe that all courses teach values, whether these values are explicitly recognized by either the instructor or the students or not. Secondly, in the contemporary American scale of values the ability to solve problems, whether by the scientific method or some other method, is pre-eminent. I believe the most important single criterion in selecting and ordering materials for any introductory college course, geographic or otherwise, should be their potential contribution to the development of problem-solving abilities by the student. Hence the question of how takes precedence over what.

But the what question is important, too. Part II, The Structure of Geography, is an analysis of geography as an ongoing scholarly community, including its major research foci, its value system, its methods and technology, and its major organizing concepts. This emphasis on geography as a community of scholarship reflects the second item in my scale of instructional values. That is, I believe that the contribution of geographers to general education will be in more or less direct proportion to the degree to which we understand ourselves. Put differently, I believe that the ideas of anthropology, sociology, and psychology are much too valuable to be applied only outside the walls of universities. I think we geographers should borrow these ideas to understand ourselves, as well as borrowing them to explain the behavior of far-off tribesmen. Self understanding should help us to sort out those aspects of the idea-system of geographers most worthy of communication to the world at large.

A closely related idea is my conviction that an introductory course in geography should literally introduce geography or as much of it as can be encompassed in a single course. I believe that the teacher of introductory courses should not base his selections of what to include on the basis of a narrow vision, of some highly personal whim or prejudice. In short, I believe that an introductory course reflecting the ideas of the whole of the geographic community is likely to be of more benefit to the student than a mere course in McNee-ography.

Part III, Relating the Structure of Geography to Liberal Education and Course Strategy, is a systematic analysis of each aspect of the structure of geography in terms of its utility for liberal education and in terms of how well it could be presented in either the lecture-demonstration format or the problem-solving format. That is, one cannot assume that all ideas relevant to us, as geographic specialists, are equally relevant to the student.

Part IV, the Institutional Setting, deals with the general institutional question, how well the proposed course might fit into the kinds of institutional settings widely found in the United States, and with the more restricted question of how the course fits into the curricular framework of the University of Cincinnati. Part V, Course Design, is the outline of the proposed course.

Part I. Lecture-demonstration vs. Problem-solving

Introductory courses in geography as liberal (general) education tend to differ widely in the degree to which they emphasize either (a) the demonstration of the conclusions or findings of the discipline or (b) initiation of the student into the ways of knowing characteristic of the discipline. Most introductory courses involve something of both, but usually one is emphasized much more than the other. Most commonly, introductory geography courses have stressed demonstration of the findings of the discipline. That is, they have aimed primarily to transmit what it is that geographers have learned. Hence the dramatic wall map, the "grand design" textbook, and the spell-binding lecture have long been touchstones of geographic education. Techniques of demonstration have preoccupied some of the best minds in the field. Indeed, for many, general education and the demonstration type of course have been considered almost equivalent. Yet there have always been some geographers teaching introductory geography courses in general education who have stressed the geographer's way of knowing rather than what the discipline has concluded. In such courses, the topographic map exercise is likely to be emphasized more than the wall map, field work more than field trips, searching discussion more than summarization, data sources and interpretation more than conclusions, the formulation of problems more than certainty of answers, and intriguing unsolved problems more than solved problems. Though most courses involve both approaches, the tendency to stress one or the other approach accounts for some of the most significant differences in course design.

A course stressing demonstration, rather than the geographer's way of knowing, has many advantages. It can have the elegance, clarity, and order of the dining room because it has left all of the messiness in the kitchen. The student's immediate hunger for significant geographic generalizations can be filled, and quickly. In such a course, there is ample time to give him something of everything about geography, from canapes to cake. Indeed, the student may leave the course with a well-nourished feeling, or even that glorious Thanksgiving Day overstuffed feeling. Such courses are never charged with too much emphasis on geographic research techniques and they are seldom charged with being too narrow in scope.

A course which stresses initiation into the geographer's ways of knowing is more like a Boy Scout cookout than it is like the elegant meal described above. The Tenderfoot is likely to be frustrated and unhappy until he learns to build a fire, to keep the food from burning, and to have the patience to wait until the food is cooked. At first, his meals are likely to be highly unconventional, disorganized (dessert first, soup last), and, to a casual observer, unhealthy. Yet Scouts thrive on such experiences. There are both the immediate satisfactions of doing something for oneself and the long-range satisfactions of self-confidence in probing the unknown. So it is with students in courses stressing problem-solving. There are both immediate and long-range satisfactions in creating your own map, in interpreting a complex pattern on an air photo, in analyzing store locations from primary data, in making a choice among alternative possibilities in the location of a factory, in finding the Corn Belt for yourself rather than having it thrust upon you, in discovering the diffusion process through plotting the spread of hula-hoops or skyscrapers, in finding the meaning of political boundaries through plotting movement (or the lack of it) across a boundary, or in anticipating Aristotle by noting similarities and differences between Greece and Persia. Such satisfactions are maximized in a course stressing problem-solving.

Stressing problem-solving is not without potential dangers. Some introduction of geographic research techniques is necessary; unless the introduction of such techniques is carefully controlled, the course can become too specialized for the purposes of general education. Stressing problem-solving puts a strain on teaching ingenuity, because it is very difficult to develop problems for the students which are at once challenging and yet within the competence of the students at any particular point in the course. Similarly, just as a demonstration course runs the danger of shallowness or superficiality in its stress on comprehensiveness, the problem-solving course runs the danger of narrowness or lack of comprehensiveness in its stress on analysis in depth through the solution of problems. However, awareness of these dangers can do much to mitigate them.

I believe that there is a need for a greater stress on problem-solving in introductory courses today than has been common in the past. Ours is an age of continuing change, of very rapid and far-reaching change in geographic distributions over the earth and their meaning for mankind. As the pace of change has quickened, geographic interpretations from the past become less and less useful; indeed, past interpretations may be a definite handicap in interpreting the real world of today. I believe we must prepare the student for this world of rapid change. I believe that the best way to do this is to develop his problem-solving abilities, so that he is equipped to function in a world in which the "truths" of today become "untruths" or irrelevant tomorrow. According to some observers, the present-day half-life of science is about 10 years; only about half of what is accepted as true in science today will still be considered true 10 years from now, and only about a quarter in 20 years, and so on. This clearly means that habits of inquiry, positive attitudes toward problem-solving, are of more utility to the student in the long run than memorization of the conclusions of a particular point in time. Who can say just what the half-life of geography is? Perhaps the half-life of geography is more than 10 years, perhaps it is 12.5 years or 15 years. But certain it is that any "complete meal" that we prepare for introductory students today will be out-moded, or archaic, long before the student has finished his useful life as a citizen. Hence I believe that the goal of widespread geographic literacy can best be served by stressing problem-solving as a major value in geographic general education.

In urging greater stress on problem-solving, I do not mean to imply that there are no values in the demonstration type of course, nor that problem-solving should completely dominate an introductory course in geography as liberal education. Problem-solving takes a great deal of time; it would probably not be possible to give sufficient breadth to the course if demonstration were eschewed altogether. Similarly , some aspects of geography lend themselves more readily to problems at the introductory level than others; if one were to treat only those aspects of geography readily taught in simplistic problems, many of the more challenging ideas of geography would not appear in the introductory course at all. Rather, in stressing problem-solving, I assume that a viable course would include both demonstration *and* problem-solving but that, in designing the course, the instructor would *first* try to develop appropriate problems and *secondly* develop demonstration materials.

The most important reason for developing problem-solving materials first, before developing demonstration materials, is that the weight of the lecture tradition, pre-dating the printing press and the widespread supply of cheap printed materials, tends to make prisoners of us all. The beginning teacher, trained primarily by being lectured at, tries valiantly to develop sufficient lecture material so that he, too, can "fill up an hour." After a few years of experience, he tends to become so enchanted with his own lecturing style that he finds it very difficult to conceive what it is like to be in the student's position. He tends to think of the educational problem in simplistic terms, as merely a question of up-dating, or otherwise improving, lectures. Seldom does he think in broader terms, of how the transmission of ideas from teacher to student might be improved, of experimentation with any and all means to speed education, whether through reading, lectures, problem-solving, or other means. I include myself in this indictment; it is only with difficulty that I have been able to stop talking long enough to consider other possibilities than lecturing. In short, unless a real effort is made to try alternatives, particularly problem-solving, geographic education will continue to prepare students for the world that *was* rather than the world that *will be.* Yet it is this world of the future for which we are supposed to be preparing students.

Part II. The Structure of Geography[3]

Geography is what geographers share.[4] Not what geographers do, but what they share. In short, professional geography is a sub-culture within the general American culture. Though there is indeed an international geographic sub-culture, national cultures lay a heavy hand on geographic professional communities. Since we are concerned here primarily with guidelines for an introductory geography course for American students to be taught by American geographers, it seems wise to limit the discussion to American geography and the American geographic sub-culture. Further, to make this analysis more pointed (though perhaps less accurate from the anthropological point of view), geographers may be viewed as a tribe. Like a tribe, they have their totems and taboos, their tribal heroes, their sacred books and symbols, their rallying cries, their characteristic modes of thought and speech, their division of labor, their methods of establishing authority, their ways of selecting scouts to seek out new hunting grounds, and their views toward other tribes. They freely adopt members of other professional tribes, but only if such members are willing to think, act, and behave like "true" geographers. They freely adopt ideas and tools from adjacent tribes but only if such ideas or tools can be recast in a geographic framework or otherwise sanctified. Some members of the tribe stress tradition, the "unbroken line of splendor" leading from Greece and Alexandria. Other tribal members stress the adoption of new ideas from neighboring tribes, the better to advance the growth and well-being of the tribe. A crucial few stress the nurturing of genuinely new ideas originating within the tribe.

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[3] In writing Part II, I have borrowed heavily from the ideas of William Pattison, partially as expressed in "The Four Traditions of Geography," *Journal of Geography*, LXIII, (May, 1964), 211-216, and in a draft copy of Chapter Two of his forthcoming book, The Geographer's Way, and partially in direct consultation.

[4] Robert B. McNee, "An Approach to Understanding the Current Structure of Geography," Chapter 6, of *Concepts and Structure in the New Social Science Curricula* (see above).

Central Research Questions

In analyzing such a tribe, where does one begin? I think one should begin with the questions, or groups of questions, to which geographers have sought answers. For it is these research themes, directions of inquiry, or intellectual problems which have attracted most geographers into the tribe in the beginning. It is these intriguing, puzzling, questions which have fired the imagination and inspired researcher, teacher, and student alike. It is these problems which have given direction and thrust to both geographic research and geographic education.

The Science of Geography[5] lists four major "clusters of research interest:" (1) physical geography, (2) cultural geography, (3) political geography, and (4) location theory studies. Regional geography or area studies is noted briefly, but not identified as a major research theme. William Pattison[6] has a somewhat different list: (1) geography as earth science or physical geography, (2) man-land geography or geography as ecology, (3) spatial or geometric geography, and (4) geographic area studies or regional geography. Pattison's list concerns approaches or "traditions" in geography rather than only current research themes, the topic of the ad hoc committee. Consequently, Pattison's list is the more complete and comprehensive, but the two lists are generally quite compatible. The Science of Geography listing of physical geography appears identical with Pattison's physical geography; The Science of Geography listing of cultural geography corresponds closely with Pattison's man-land or ecological geography; The Science of Geography's location theory studies can be included with no major distortion in the somewhat broader category of Pattison's spatial geography.

Political geography, as described in The Science of Geography, appears to me to be an amalgam of man-land geography, area studies, and spatial geography with primacy given to questions of spatial order. Interest in the spatial consequences of political processes stresses a geometric research focus; interest in landscape transformation carries overtones of a residual research interest in man-land geography. Other topical categories in geography, such as economic geography, have also been, and partially continue to be, amalgams in terms of research themes. Traditional economic geography has contained elements of the man-land question, the area study question, and the spatial question, with primacy among these questions shifting over time. Today, the spatial question dominates at least the production core[7] of urban-economic-transportation geography, with man-land questions and geographic area study questions relegated to a quite subsidiary position.[8] Other topical headings in geography, such as population geography or social geography, seem also to contain varying proportions of the four basic research questions noted by Pattison. Thus one may conclude that for our purposes here the political geography research theme noted in *The Science of Geography* can be broken into its component parts and redistributed under the man-land, geographic area studies, and spatial headings, with the major portion being joined to a broad spatial or geometric research cluster. The existence of geographic area studies (regional geography) on the Pattison list of traditions and its absence on *The Science of Geography* list of research clusters does *not* mean that regional geography has no potential as a research theme, that it is necessarily a dying tradition. The *ad hoc* committee was constrained to consider the scientific aspects of geography rather than geography *per se.* Humanistic aspects of geography perforce were slighted in the report. For many geographers, regional geography has been a major vehicle to express their humanistic tendencies as well as their scientific tendencies. Indeed, much of the most vital regional geography has been humanistic in tone and spirit, however much it may rest on scientific underpinnings. Likewise, there has been a tendency, at least in the past, for much of the research in regional geography to focus on educational objectives, i.e., to stress the understanding of areas for the purpose of helping students to understand the diversity of the earth. However, there is no inherent reason why research in geographic area studies need be limited to either humanistic or educational objectives. The objectives in geographic area studies research *can be* quite as broad in scope and as "pure" as those of any other research objective. Indeed, geographic area studies research undertaken in this spirit can be highly effective in clarifying the "answers" derived from research directed to solving problems in physical geography, man-land geography, or spatial geography.

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[5] Report of the Ad Hoc Committee on Geography, Earth Science Division, National Academy of Sciences—National Research Council, The Science of Geography (Publication 1277, Washington, D.C., 1965), pp. 80.

[6] William Pattison, "The Four Traditions of Geography," Journal of Geography, LXIII (May, 1964), pp. 211-216.

Peter Haggett[9] also lists four areas of geographic inquiry. He does not list physical geography as a distinct topic of inquiry, apart from research on other geographic questions. No doubt this is because his book concerns "human geography." His listing of geography as areal variation seems analogous to geographic area studies as defined here; his geography as location studies seems to equate with the location theory cluster of the *ad hoc* committee and with Pattison's spatial or geometric geography; he distinguishes between the landscape school of geography and the ecological school, a distinction not made by either Pattison or the *ad hoc* committee. I do not think that this distinction is sufficiently important to list separately, unless one were prepared also to subdivide the various lines of inquiry found within physical geography, geometric geography, and geography as area studies.

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[7] Robert B. McNee, "Toward Stressing Structure in Geographic Instruction or Good-by to Hevea Braziliensis and All That," position paper for National Science Foundation: Summer Institute in Approaches to Introductory College Geography, Columbus, 1966.

[8] Edward J. Taaffe, "Introductory Economic Geography: Selected Ideas or Thorough Coverage," position paper for National Science Foundation: Summer Institute in Approaches to Introductory College Geography, Columbus, 1966.

[9] Peter Haggett, *Locational Analysis in Human Geography* (New York: St. Martin's Press, 1966). 399 pp.

One may conclude, therefore, that a four-fold listing of the major research questions or clusters of research interest in geography today includes: (1) pure physical geography, or physical geography for its own sake, (2) man-land geography, or questions concerning the interface between human systems and physical-biological systems, (3) spatial geography, now focusing on location theory in urban-economic-transportation geography but deriving for a very ancient geometric concern in geography and now spreading to diffusion theory in cultural geography, spatial political geography, and a general concern for the unraveling of the spatial dimensions of society as a whole, and (4) geographic area studies or regional geography, in the sense of fundamental area research rather than only applied research for teaching or planning purposes.

These four distinct research themes are mutually supporting to some degree but the unrestricted development of each tends to lead in four different directions. Unfettered research in each thus produces divisive or centrifugal effects within geography. Indeed, in the research sense one may speak of *geographies* or the *geographical sciences* more accurately than one can speak of a single, highly unified, research endeavor. Historically, geographers have been unwilling to accept such a loose alliance as is implied in "the geographical sciences." They have tended, instead, to try to counter this divisive tendency by various means. The now classic solution has been to give precedence to one of the four directions of inquiry and to subordinate other types of inquiry. However, the research question being given dominance has tended to shift from one to the other over time. And always there have been individualistic, "deviationist," geographers who have resisted the popular trend and continued to cultivate the research theme of their choice.

The general pattern is well known. In the 19th Century, some geographers wanted to restrict inquiry to physical geography alone. In the late 19th Century and early 20th Century, interest in the man-land question quickened and many man-land geographers felt that physical geography, geographic area studies, or spatial geography should be cultivated only insofar as they contributed to illuminating man-land questions. Later, geographic area studies flowered and in the councils of the mighty physical geography, spatial geography, and man-land geography were subordinated to the rebirth of a very old geographic vision, chorology. Probing of the geographic area studies question reached its height just before, during, and after World War II. In the last 15 years perhaps the oldest geographic question of all, the geometric question, has again achieved the spotlight. In the light of past history, one should not be surprised to find geography being re-defined today by some geographers in such a way as to give pre-eminence to the revived spatial question and to subordinate physical geography, man-land geography, and area studies geography. Indeed, *The Science of Geography* seems to give spatial geography a central position. I believe this accurately reflects contemporary trends. But what of more long-range trends?

I see no reason for believing that the persistent pluralistic tendency of the four research traditions will be long contained by anyone's definition of geography as a whole, even though my own sympathies clearly lie with the spatial direction of inquiry. Both *The Science of Geography* and Edward Taaffe make an excellent case for the centrality of the spatial question and the subordination of the other three questions. Robert Kates[10] seems willing to accept the centrality of the spatial question and the subordination of his own special interest, man-land geography, so long as he is allowed to pursue his own investigations in peace. Yet it remains to be seen whether he and other man-land geographers will in any basic sense limit their research to topics contributing to the illumination of the spatial question. Alternatively, they may rejoice when linkages between spatial geography and man-land geography are found and yet may pursue the man-land quest whether such linkages are found or not. Though geographic area studies research is now out of fashion, I suspect that there will continue to be hardy area studies geographers willing to pursue the questions they themselves consider important, even at the price of being ignored by others. As Taaffe indicates, the rise of spatial geography and the decline of geographic area studies may encourage a revival of physical geography since in certain ways the two themes can be supportive. But one wonders whether, in the long run, research in physical geography can be restricted to its spatial phases. The current spatial emphasis may turn out to be just as inhibiting to physical geography as the man-land and geographic area studies emphases proved to be. And which research question will predominate in the future? A decade or two hence, the probing of the spatial question may be achieving breakthroughs and may be advancing at speeds far beyond the wildest dreams of the most ardent spatial geographer. On the other hand, by then the most productive young geographic scholars may be more intrigued by questions derived from physical geography, man-land geography, or even geographic area studies. Who can say? The classic solution to the divisiveness of the four research questions—elevating one question and subordinating the others—has produced only temporary and illusory unity in the field in the past. It is quite possible that the "systems analysis" umbrella developed so effectively in The Science of Geography may convert diversity to unity. As a "systems" advocate, I would welcome such a trend. But it may, in turn, only spawn new research directions. Such has been the lesson of history. Geography is, and for the immediately foreseeable future will remain, a pluralistic research field. The field as a whole therefore has strong divergent or centrifugal tendencies. This divergence must be taken into account in any curricular planning.

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[10] Robert Kates, "Links between Physical and Human Geography: A Systems Approach," position paper for National Science Foundation: Summer Institute in Approaches to Introductory College Geography, Columbus, 1966.

The Geographic Value System

Since geography persists as a sub-culture in spite of the divergent tendencies of the four research questions noted above, there must be unifying forces to counteract divergence. Tribes and sub-cultures are held together by many bonds, of which perhaps the most important is the group value system. Is there a geographic value system and, if so, can its parts be clearly identified? I firmly believe that there is indeed such a value system, though I am by no means sure that I have properly identified all of its significant elements. Perhaps the value most widely held in common among geographers is globalism. Alternatively, it can be called the planetary view, the world view, or the earth-as-a-whole view. In any case, it involves the belief that the ultimate object of geographic concern must be the globe as a single, unitary, object. According to William Pattison, global transcendancy has provided a conceptual justification for the linkage of the four different research traditions since Erastosthenes and the Alexandrian geographers. Globalism has often inspired geographers to great hypothetical and conceptual leaps, such as the Greek hypothesizing about climatic zones or Mackinder's "closed world" system. No doubt globalism plays a role in the persistence of systematic "world patterns" courses and "world regional geography" courses for introductory students. Globalism has been stressed somewhat less in recent years, particularly less by geographers stressing problem-solving in both writing and teaching. Yet globalism is invoked in The Science of Geography as if to sprinkle holy water on the reawakened concern for geometric geographic questions. It stresses the "need for understanding the world-wide man-environment system."[11] Thus, the ad hoc committee was able to express its globalism in the rubric of systems analysis. Belief in globalism varies in intensity among geographers, but few, if any, geographers are entirely without it.

Values are often strange and, superficially considered, contradictory things. The same geographers who often stress globalism may also be very strong adherents of localism. By localism I mean a conviction that it is necessary and desirable to study small areas directly and in situ, whether for research or for instruction. Most commonly, localism is expressed in a desire for field trips and/or field work and a disdain for "armchair geography" or geography so abstract that it cannot be observed directly in the field. The origins of localism as a geographic value are somewhat obscure. William Pattison has suggested that possibly some type of polarity of values is involved, i.e., that the sweeping generalizations required by globalism have produced localism as a type of antidote or anti-body. There seems at least limited justification for this view. Some of our strongest globalists are also strong localists; those geographers least bound by the bonds of the global constraint seem also willing to forego localism. In any case, some recent weakening of both globalism and localism has been accompanied by a renewed concern for levels of generalization between the local and the global. Some geographers, such as James Blaut, contend that the strongest hypotheses in geography will come at the micro-study level. Overall, localism seems to be a somewhat weaker value than globalism, though few geographers are unwilling to give at least lip service to this value.

Holism (comprehensiveness, a delight in geographic synthesis) is another widely held value. According to this value, there is something inherently "good" about a "total" treatment of a place or a process. On a strictly logical basis, the comprehensiveness needed in any study is a direct function of the purposes for which the study is being made. But we are dealing here with something other than strict logic, in fact, with values. Possibly globalism and localism are only special cases of this yearning among many geographers for a comprehensive view. But as I am using the term holism here I am referring to topics as well as areas. Thus, although holism is perhaps most strongly evident in area studies geography, it is also apparent in other branches. Much of the lure of physical geography is in its completeness, its unification of the physical and biological worlds in one grand whole in which the interconnectedness rather than the separateness of the parts is stressed. Man-land geography is another grand design, stressing the interconnections between one great system (the ecosystem) and another (the human system). Maps have always been the great sign and symbol of spatial geography and the map can be used to link all kinds of diverse phenomena in a detailed yet comprehendable whole. Though the term holism is not unknown in geographic writings, it is seldom used in ordinary geographic discourse. Yet the holistic value is clearly one of the major yardsticks used by many geographers in deciding whether a given work is "true" geography or whether it falls beyond the pale.

Perhaps map-love is the oldest of geographic values and the one most responsible for attracting young people either into the profession itself or to geography as a hobby. A great many professional geographers first became interested in maps and, through maps, in other phases of the discipline. By map-love I do not mean simply the ability to use maps as an ordinary means of communication like word language or statistics. Nor do I refer here to the use of maps as a research tool. I mean rather a simple and somewhat naive wonder and delight in maps as a source of aesthetic experience. One can but speculate about the psychological meanings of this attraction to maps. But in any case, few geographers can avoid looking at a map—any map. Geographers tend to "understand" each other through the maps that they alike enjoy. Non-geographers who also enjoy maps are generally held to be "good guys" and even "brothers under the skin." Many geographers find it hard to believe that there are actually some people who literally find maps boring, insignificant, or too difficult to understand.

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[11] Ad Hoc Committee, The Science of Geography, p. 10.

At least some geographers seem to place high value on earth reverence. By this I mean a belief that the earth is somehow quasi-human but with powers much greater than those of mere humans. References to the "personality" of places may reflect this, as may terms such as "face of the earth." Earth reverence comes strongly to the fore in the type of geographic conservation course which stresses the negative aspects of man's modification of the earth. William Pattison notes that such earth reverence may be a survival of values similar to those expressed in the ancient earth-mother religions. There is an apparent value conflict among geographers vis-a-vis the man-nature dichotomy. The value most frequently verbalized today by geographers is that man and nature are one and inseparable and that therefore attempts to make neat divisions between them for purposes of analysis or otherwise are misleading and dangerous. Yet in the larger society, this distinction is usually made, with all of its ramifications such as the classic division of natural science and social science. Some geographers see the principal mission of geography as the healing of this breach. They would like to "convert" all society to the "right" view, i,e., that man and nature are one and inseparable. Other geographers, however, seem more willing to accommodate to the larger society, either because they like the man-nature distinction or because neither man-nature nor "oneness" are strong values for them.

Perhaps the strongest value of all is the most obvious: the value of geographic inquiry, or the exploration for new geographic truths (problem-solving). That all geographers uphold this value, though to varying degrees, needs no explication.

It is highly unlikely that I have identified all geographic values; the values most obvious to someone from outside a culture group may be those least recognized by those within the group. Still, I believe that a continuing search for the values held dear by geographers could be highly rewarding. Pinpointing values as values, and not as objective "truths," could speed the dialogue on curricular reform in geography. Behind every, or nearly every, heated exchange among geographers over the "right way" to teach geography there lurks a value conflict. The real issues in curricular reform can be clarified by identifying our values as accurately as we can.

Whatever the total list of geographic values might be, these values provide a basis for community, for sharing; they act to unify geography, countering the divergent thrusts of the four different research themes. Though nearly all geographers seem to hold the values here discussed to at least some degree, the geographic value system as a whole is not at all a simple one. Individual geographers vary greatly in their ordering of these values. For some, globalism is the supreme value, with all others subsidiary to it. For others, holism is paramount, with globalism, map-love, and so on as special opportunities to express holism. Still others are driven by map-love primarily, with the globe seen as simply a giant map and holism as a very complicated map. And so on. Other geographers seem to hold all of these values in almost equal esteem, varying over time in which they give precedence. The more traditional geographers, who tend to be those who see themselves primarily as teachers rather than as researchers, cling most firmly to the first six values and resist strongly if new directions of inquiry in the field seem to threaten these values. Geographers who see themselves primarily as researchers, however their active professional time may actually be divided, are usually far more willing to sacrifice one or more of the first six values it it conflicts with their quest. For them, the supreme value is progress in the exploration of one or more of the four major research questions; sacrificing the constraints of one or more of the other values is a small price to pay for free inquiry. Hence there is continuing conflict among geographers over values, both as to the relative merits of each of the first six values and as to the merits of the unfettered research quest versus the preservation of values such as globalism. These conflicts are continuous but they are heightened by curricular discussions, such as what the nature of introductory college geography courses should be.

Methods and Techniques

Common methods and techniques also help to unify geography, in spite of the disunity created by the four different research quests. "The centripetal effect of a common research technology needs little exposition. A common understanding of maps, air photos, space models, statistical methods, and".... "geographic field methods encourages interest in otherwise disparate research. New methods may therefore be feared as a divisive influence, but once the new methods have become widely accepted, they join the old in unifying a field. Current scattered resistance to the new statistical methods in geography may be a case in point."[12] Common teaching methods and techniques also have a contripetal effect. The traditional reliance on the wall map as a teaching device is an example. The widespread use of field trips in instruction is another. Perhaps the most important is the traditional conception of the role of the geography teacher. Traditionally, most geography teachers seem to have seen themselves primarily as lecture-demonstrators rather than leaders to initiate the student into active geographic problem-solving. Strangely, this seems to have been true even for geographers themselves very actively engaged in geographic research or problem-solving. The predominance of this lecture-demonstrator tradition in geography may be one of the strongest supports for such traditions as holism and globalism. The lecture-demonstrator tradition does, after all, call for stress on the creation of the "grand design," the overall blueprint. The problem-initiator role, on the other hand, calls for the probing of small pieces of reality, the antithesis of the "grand design."

Geographic Vocabulary and Organizing Concepts

Still another source of unity in geography is a common language or vocabulary. Most geographers know what an esker is whether they have any interest at all in probing the research frontier of physical geography. The term "central place" is now widely used, and misused. But more important than the circulation of particular terms is that geographers commonly use the terminology of one research cluster in the development of analogies in other research clusters. The terminology of physical geography, especially, has been repeatedly mined in this fashion. From watershed, we have derived milk sheds, commuter sheds, and so on. L. G. Wolf refers to the service area of a church as a "salvation shed." Similarly, the term "traffic shadow" seems to be directly derived from an analogy with the older term "rain shadow." In short, the terminology of geographers crosses major research boundaries and hence tends to produce unity in thought.

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[12] Robert B. McNee, "The Structure of Geography and its potential Contribution to Generalist Education for Planning," Professional Geographer, XVIII (March, 1966), p. 64.

In addition, there are a number of organizaing concepts which serve as major links in communication among the four research traditions. To serve in this manner, the concept must have had a mixed parentage, originating in more than one of the four research traditions, or must be used in more than one research tradition even if originating in only one. Further, the concept must be rather broad and vague, often with multiple meanings attached to it. Broad, organizing, concepts which might fit such criteria include landscape, areal association, spatial interaction, regions and regionalizing, and, possibly, scale. The term "landscape" is very widely used by some geographers, though studiously avoided because of its ambiguity by others (including this author). The term may have originated in physical geography but it has been used in man-land geography, geographic area studies, and spatial geography. Sometimes it appears to refer to the physical-biological land surface along; at other times it appears to mean the total man-land complex in a place; at still other times it seems to imply more the actual mapping of the earth's surface; while in other cases it seems to mean the unit area used in area studies. Perhaps the concept continues to have currency, despite scholarly analyses of its ambiguity, *because* of its very ambiguity. For some geographers, at least, it seems to be a useful tool for bridging the gaps among the four research traditions. *Areal Association* refers to all kinds of relationships *in a place* as distinguished from *Spatial Interaction* which includes all kinds of relationships *among places*.[13] Areal Association (and a related concept, element-complexes) is broad enough and vague enough so that it can refer to areal associations of physical-biological geography alone, or it may refer to man-land associations, or to the spatial distribution of any phenomena (as in the spatial tradition), or to areal associations which give character to the unit areas of area studies geography. Spatial interaction, like the older concept of circulation, can be used not only to refer to urban linkages (as in the concept of situation) but also in physical geography (the migration of plants and animals; the movement of wind and water), and in man-land geography (the movements of peoples in relation to habitat). That regions and regionalizing are widely used concepts in all four traditions is well known. Perhaps scale should not be listed as one of the major organizing concepts of the field; perhaps it would be more accurate to say that all geographers are *concerned* with the significance of scale in interpreting all geographic "truths."

While a common vocabulary and a common organizing concepts no doubt have at least some effect in unifying the otherwise differing research clusters, the unifying effect of such concepts and vocabulary is primarily important in the teaching enterprise, particularly with introductory courses. In terms of subject matter included, introductory geography courses around the country appear to differ very widely. On the other hand, I suspect that most of us could immediately recognize a course in introductory geography developed by a fellow geographer and readily distinguish it from a "geography" course developed by a non-geographer. I refer here to the fact that in many institutions "geography" is taught by those primarily identified with other fields such as geology, history, economics, or anthropology. Vocabulary and organizing concepts would be important yardsticks in such an evaluation, though these yardsticks might be used quite unconsciously. If such vocabulary and common organizing concepts could be pinpointed with more precision than has been possible in this document, it might be possible for geographers to more consciously unify the four research traditions within the framework of introductory courses.

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[13] Edwin N. Thomas, "Some Comments about a Structure of Geography with particular reference to Geographic Facts, Spatial Distribution, and Areal Association," *Selected Classroom Experiences: High School Geography Project*, ed. by Clyde Kohn, (National Council for Geographic Education, 1964), pp. 44-60.

The Structure of Geography: A Summary

According to the thesis developed in this paper, there are four different directions of geographic research: physical geography for its own sake; man-land geography, concerned with the interface between physical-biological systems and human systems on the earth; area studies geography or chorology; and spatial or geometric geography. The probing of these research clusters gives direction and thrust to the field but creates divergence within it. In spite of this, geographers are held in a community by the combined effects of a shared value system (especially globalism, localism, holism, map-love, earth reverence, the unity of man and nature, and the love of geographic inquiry), a common methodology and technology (to some degree in research and to a high degree in teaching), and a common vocabulary and set of organizing concepts (especially such concepts as landscape, areal association, spatial interaction, regions and regionalizing, and scale). Such unity as exists is most evident in introductory courses, less evident in advanced courses, and decreases in evidence as one approaches the research frontiers.

Part III. Relating the Structure of Geography to Liberal Education and Teaching Strategy

The geography major should be introduced to most, if not all aspects of the structure of geography as a discipline; however, not all aspects of the structure of geography are necessarily significant in liberal (general) education. One must be selective; for those aspects selected, one must determine some rank ordering or priority. Here the selection process is guided not only by the broad, general, aims of liberal education but also by the assumption that some aspects of geography can be taught best by the problem-solving approach while other aspects are more suited to the demonstration approach.

The Relation of the Geographic Value System to General Social Values

Among the values held dear by geographers (globalism, localism, holism, map-love, earth reverence, the unity of man and nature, and the love of inquiry or problem-solving), the first two are clearly pertinent to liberal education. Globalism has obvious advantages in reducing parochialism. Chauncy Harris has stated the case well in his plea for the study of foreign areas and peoples.[14] Localism, on the other hand, encourages in-depth analysis and perceptive observation, clear values for liberal education. Thus, attention to both localism and globalism should be considered in designing courses for liberal education. The case for holism is not quite as good, perhaps, but the broad generalizations permitted by holism may be of great value in helping students to recognize forests as well as trees. Aesthetic experience is an important part of liberal education and no source of such aesthetic experience, such as maps, should be eschewed. Yet one wonders whether geographers are very effective in communicating map-love to non-geographers except as a by-product of other activities. In that case, map-love need not be considered explicitly in course design. However, explicit attention to maps as a time-saving device and as a means of both communication and analysis could have the by-product of communicating this map-love. No doubt the choice of a title such as "map appreciation" rather than "map reading" for a map course, as at Clark University, reflects a desire to allow expression of map-love. In my opinion, it would be difficult to make a strong case for the value of earth reverence and the belief in the unity of man and nature for liberal education except as an attempt to make the student aware of the limitations of our culture. The general American culture seems to stress a quite different view, glorying in man's alleged "conquest of nature." It could broaden the student's outlook to realize that at least some people consider the "conquest of nature" theme inadequate. If this question were presented as an issue, a basic value conflict rather than something for which we can establish objective answers, the cause of liberal education would indeed be served. The love of inquiry is of such an obvious value to liberal education that it needs no exposition.

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[14] Chauncy D. Harris, "The Geographic Study of Foreign Areas and Cultures in Liberal Education," Geography in Undergraduate Liberal Education, (Washington, D.C.: Association of American Geographers, 1965), pp. 25-33.

Many, and perhaps all, of these values would be quite appropriate for a lecture-demonstration course stressing the findings of geography. For a course stressing geographic problem-solving, one cannot be so sure. In such a course, the most significant values are the love of inquiry and localism, particularly if localism is expressed in terms of actual field work and observation by the student, presumably in the university locality. Globalism should not be ruled out entirely in such a course. However, globalism would have to be muted in order to have geographic problems of a complexity appropriate for beginning students. For similar reasons, a course stressing problem-solving would of necessity give limited attention to holism, map-love, earth reverence, and the unity of man and nature in the specific design of the course. These values would find their expression by indirect means through the personality of the instructor and their reflection in geographic writings. Highlighting one value—the initiation of the student into geographic problem-solving—cannot be attained except through reducing the specific attention devoted to many of the other values long held dear by geographers.

Methods and Techniques

The justification for the inclusion of geographic research methods and techniques in an introductory course for liberal education must lie in their general utility or applicability. That is, only those methods or techniques should be introduced which one could reasonably suppose might ultimately be useful to the student in other contexts. For example, the more technical aspects of cartography seem of dubious value for general education. Fortunately, a relatively small percentage of geographic research methods or techniques are so specialized that their introduction would be clearly antithetical to the aims of liberal education.

A course stressing the presentation and demonstration of the findings of geographers has little need for the introduction of geographic research methods and techniques; instead, it has need for a vast array of geographic presentation techniques, of which the foremost today is the wall map and in the future may be transparencies. However, a course stressing geographic problem-solving does need geographic research methods and techniques. These should be introduced in a highly selective manner, introducing only those actually needed for problem-solving within the course itself, and then only as needed. Though the problem-solving type of course must of necessity de-emphasize some parts of the structure of geography (such as certain aspects of the value system), it emphasizes other aspects of that structure (the love of geographic inquiry and geographic methods and techniques).

Geographic Vocabulary and Organizing Concepts

The criterion for the inclusion of a specialized geographic vocabulary and the organizing concepts of geography in an introductory course in liberal education must be the long-range utility or applicability of such vocabulary and concepts. Though this is a criterion most often honored in the breach, it is a highly significant one. A great many courses in liberal education, geographic and otherwise, turn out to be vocabulary exercises, with dozens if not hundreds of highly specialized terms of little value to the general student. It should be possible to develop a list of geographic terms, such as hinterland, accessibility, or environment, which would have long-range utility for the student as well as having value within the confines of the course. Other geographic terminology should be eschewed, except as absolutely vital to the course itself. Among the great organizing concepts of geography, two which should unquestionably be introduced *by name* are regions and scale, because these terms have wide currency outside the profession. The concepts of areal association and spatial interaction, whether specifically introduced by name or not, would seem to have great general value for non-geographers as alternative ways of organizing reality. My reservation about introducing these terms *by name* is based on a desire to keep jargon to a minimum. Yet the *ideas* represented by these terms are important. That is, it is the idea which is important, not the term. On personal bias, I would exclude the concept of landscape.

I see no reason for believing that the introduction of vocabulary and organizing concepts should differ for a demonstration course and a problem-solving course except, perhaps, in the sequence of their introduction. In a lecture-demonstration course such vocabulary and/or organizing concepts could be introduced first by name and then explained and illustrated. Alternatively, examples to which such terms or organizing concepts could be applied could be introduced first, followed by the actual introduction of the term by name. In a problem-solving course, however, it would seem advisable to follow the latter course, that is, to give the student experiences with a situation before a name is supplied as a handle.

The Four Clusters of Research Questions

For the aims of liberal education, all four of the geographic research traditions seem highly significant. Certainly every educated man should have the kinds of understandings of nature and natural processes *in situ* provided by physical geography. Courses of the types advocated by Melvin Marcus[15] and Douglas Carter[16] would be truly liberating courses for most students. Man-land geography also deals with fundamental questions significant for a liberal education. That is, I concur wholeheartedly with the statement in *The Science of Geography*: "one of the great problems of scholarship...... is a full understanding of the vast overriding system on the earth's surface comprised by man and the natural environment. Indeed, it is one of the four or five great overriding problems commanding the attention of all science."[17] The ideas of Robert Kates, supplemented by ideas drawn from Homer Aschmann,[18] Wilbur Zelinsky,[19] and Donald Meinig,[20] would provide a fine basis for such a course. Similarly, a course based on the geographic area studies research cluster could expand the student's horizons, whether the course were cast in the traditional world regional format or whether it followed the more imaginative design developed by Ann Larimore[21] with the advice of Norton Ginsburg and Chauncy Harris. So also could courses emphasizing the spatial tradition, such as Arthur Robinson's map course[22] or the course now being developed at Iowa.[23] In my view, an advantage of the spatial approach for liberal education is that the spatial approach is peculiarly fitted to introduce the student to some of the major social forces now at work on the earth: urbanization, expanding interdependence and declining isolation, accelerating economic development, cultural diffusion and integration, and the erosion of old political loyalties.

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[15] Melvin G. Marcus, "Introductory Physical Geography in the College Curriculum," position paper for National Science Foundation: Summer Institute in Approaches to Introductory College Geography, Columbus, 1966.

[16] Douglas B. Carter, "The Role of Climate in the Introductory Physical Geography Course," position paper for National Science Foundation: Summer Institute in Approaches to Introductory College Geography, Columbus, 1966.

[17] Ad Hoc Committee, *The Science of Geography*, pp. 8-9.

However, developing four introductory courses, one for each of the research traditions, does not seem very practicable. Even if space in the college curriculum permitted this, it would seem more desirable to concentrate on one, or at most two courses, rather than to diffuse effort too widely. Furthermore, presumably the aim should be to introduce *geography* rather than one of its segments only. Hence some kind of compromise is necessary.

One classic solution to this dilemma is to select one of the four, usually that for which one has the greatest research affinity, and to use that as the basic theme for the course. Depending on the catholicity of the instructor, the other research traditions may appear as significant sub-themes or they may hardly appear at all. The greatest advantage of this solution is that such a course can be highly coherent and structured. Its major disadvantage is that it only partially introduces *geography*, principally one of its divisions.

Another classic solution to the dilemma involves the pairing of research traditions. Thus, the classic physical-human geography arrangement. In one course, or in the first half of a single course, physical geography is emphasized. In the other, "human geography" is emphasized. However, in specific courses the man-land tradition may dominate this "human geography" segment while the spatial tradition and area studies are either sub-themes or disappear. In other "human geography" courses, the area studies theme may dominate while the spatial tradition and man-land geography are either sub-themes or disappear. In still other arrangements, spatial geography (repre-

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[18] Homer Aschmann, ""Can Cultural Geography be Taught?" position paper for National Science Foundation: Summer Institute in Approaches to Introductory College Geography, Columbus, 1966.

[19] Wilbur Zelinsky, "The Use of Cultural Concepts in Geographical Teaching; Some Conspiratorial Notes for a Quiet Insurrection," position paper for National Science Foundation: Summer Institute in Approaches to Introductory College Geography, Columbus, 1966.

[20] D. W. Meinig, "Position Paper: Cultural Geography," position paper for National Science Foundation: Summer Institute in Approaches to Introductory College Geography, Columbus, 1966.

[21] Ann E. Larimore, "The World Regional Geography Course: Alternatives for its Teaching," draft, Commission on College Geography, Sub-panel on a World Regional Course, May, 1966.

[22] Arthur H. Robinson, "The Potential Contribution of Cartography in Liberal Education," *Geography in Undergraduate Liberal Education* (Washington, D.C.: Association of American Geographers, 1965), pp. 34-47.

[23] Under the leadership of Kenneth Rummage, as reported by Clyde Kohn, "The Iowa Approach or Revisionists at Work," position paper for National Science Foundation: Summer Institute in Approaches to Introductory College Geography, Columbus, 1966.

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sented primarily by maps and globes) is teamed with physical geography in one half of the course while area studies and man-land geography are teamed in the other part. Alternatively, sometimes physical geography is paired with man-land geography while spatial geography and area studies are linked together. Still another hypothetical possibility is to have a course with four segments of roughly equal value, with one segment for each of the four traditions, though I do not know of anyone who has tried this. No doubt someone has.

It does not seem possible to imagine any grouping of the research traditions within a course, or courses, that has not been tried by some introductory geography teacher somewhere. The decision as to which of these many possible solutions to the dilemma is "best" rests on the instructor's value judgment as to (a) the attraction of each of the four research traditions to him personally, (b) his estimate of the relevance of each of the four research traditions to the aims of liberal education, and (c) his catholicity.

The problem of choice becomes more complicated if one introduces the question of problem-solving courses versus demonstration courses. It seems apparent that all four of the research traditions can be taught with equal facility in the demonstration framework. But this is not necessarily true for the problem-solving format. Though some aspects of all four research traditions can be taught through the problem-solving approach, one cannot assume that all aspects of all four traditions fare equally well under the problem-solving format. I cannot think of any aspect of the spatial research cluster which could not be made operational in problems the students themselves could solve. Douglas Carter has given us several excellent examples of how physical geography can be taught in a problem-solving format. Perhaps all of physical geography could be so taught, though this would be a great break from the traditional "world patterns" type of course. Man-land geography presents many opportunities for student problem-solving, some of which have been indicated by Homer Aschmann. However, one wonders how well underclassmen could deal with problems using such sophisticated concepts as culture or environment. These and many other concepts in man-land geography are grand generalizations and important for liberal education; making them operational in terms of problem-solving by students with very limited experience with either cultural or environmental diversity would be a major task. Area studies, to be worthwhile, call for an especially high level of judgment and sophistication, qualities not notably present among underclassmen. Though some problem-solving in the area studies framework is entirely possible, particularly if enough time is granted and if the area is well-known to the student, perhaps the area studies tradition can generally best be served by the seasoned lecturer-demonstrator. On the other hand, if means could be devised to present area studies in a problem-solving format, area studies geography might be revitalized. If an area-studies type of geography course were presented as a senior-level, capstone, course, rather than as an introductory, freshmen-level, course, then much more problem-solving might be possible.

Relating the Structure of Geography to the Aims of Liberal Education and Teaching Strategy: Conclusions

Aspects of the structure of geography which seem particularly appropriate for the aims of liberal education include all geographic values, the less specialized geographic methods and techniques, geographic terminology in common usage such as hinterland or environment, most of the great organizing concepts of geography (though not necessarily by name), and all four of the geographic research traditions. Within an introductory course or course sequence, the four traditions may be combined in various ways, depending on value judgments by the instructor relating to his personal preferences in research and his assessment of the value of each type of research for liberal education.

A lecture-demonstration type of introductory course is particularly appropriate for conveying certain values of geographers, notably globalism, but also, if desired, holism, map-love, earth reverence, and the unity of man and nature. A lecture-demonstration course by definition eschews the research methods and techniques of geographers but makes full use of the traditional demonstration technology of geography, including wall maps. Both lecture-demonstration courses and problem-solving courses seem equally appropriate for teaching geographic vocabulary and geographic organizing concepts. All four research clusters are equally amenable to the lecture-demonstration approach, though the conclusions of these research traditions are emphasized rather than the remaining questions or unsolved problems.

A problem-solving course, on the other hand, emphasizes the questions raised by a discipline. Where introduction to these questions conflicts with other aspects of the value system, the value of inquiry must triumph over such values as globalism and map-love. Localism, however, is a value which can be quite compatible with the questing bent. Whereas the introduction of research methods and techniques is unnecessary for the lecture-demonstration approach, the research methods and techniques of geographers must be introduced in a problem-solving course to the degree necessary for actual student problem-solving. The introduction of selected geographic terminology and organizing concepts can be basically of the same nature as for a lecture-demonstration course, though the data might well be introduced before the term or concept applicable to the data. The problem-solving approach seems most applicable to the spatial research cluster and physical geography, but possibly less applicable to man-land geography and area studies geography. As a further consideration, a problem-solving course would stress those research frontiers now being most rapidly probed by research geographers. Currently, this would mean giving greatest stress to spatial geography.

A course stressing problem-solving, and yet using lecture-demonstration approaches in appropriate combinations with problems, can maximize these advantages while retaining some of the advantages previously discussed for lecture-demonstration courses. The course outlined in subsequent pages tries to do this.

Part IV. The Institutional Setting for the Course

This course is designed to fit a particular institutional setting, that of the University of Cincinnati. It will be tried as an alternative to an existing course, Geography 104-5-6, Introduction to Cultural Geography. A year course, it extends over three quarters or about 90 hours of classes. It meets the requirements of the Arts and Sciences College for a social science course; it also fulfills the need for a geography course for Education majors preparing to teach social studies. The department also offers Geography 101-2-3, and 111-2-3, Introduction to Physical Geography, a course extending over three quarters and about 90 hours of lecture and 180 hours of laboratory time. Introductory Physical Geography meets the requirements for a natural science course in the Arts and Sciences College. Thus, like many institutions, the University of Cincinnati draws a sharp distinction between social science courses and natural science courses.

Introduction to Geographic Behavior has been selected as the name for the proposed new course. This title implies that the course is to be clearly an introduction to geography as a social science. Traditionally, the physical geography courses given in most institutions have clearly been science courses. However, courses labeled "Human Geography," "Cultural Geography," "World Geography," or "Global Geography," have usually been courses in general geography, mixtures of science (physical geography), humanistic geography (regional geography), and geography as social science. Generally, the social science component in such courses has been much the weakest of the three. But today the social science component in geographic research is stronger than any other. Put differently, our research affinity for economics, political science, anthropology, sociology, and psychology has grown mightily in the last few decades. Therefore, there is a widening gap between traditional introductory geography courses in "Human Geography" and current geographic research. I believe that the time is over-ripe to develop introductory courses which more consciously reflect this long-time trend in geographic research, courses which consciously seek to narrow the gap between the research trend and teaching practice. At the same time, this would be a more honest course, a course fitting the "social science" classification of most "human geography" courses.

McCarty and Lindberg[24] have expressed the same point in a somewhat different manner. They note that some geographers tend to stress human activities (behavior) whereas other geographers seem more concerned with facilities or the physical objects associated with such activities. The proposed course would stress the analysis of activities and concern itself with facilities only as incidental to the former. Therefore, an alternative title for the course might be "Introduction to Geographic Activity." I assume geographic behavior or geographic activity to include (a) spatial patterns of movement by humans or directed by humans, (b) spatial patterns of facilities associated with such movements, and (c) human decision making which creates, maintains, and modifies the above patterns. This is meant to include human reactions to the earth, such as the development of space-adjusting techniques, resource-converting techniques, and modifications of the earth's surface. This would clearly be a social science course.

In adapting this course to the needs of other institutions, the most thorny problem is that of length. In only a few institutions does geography have two parallel introductory courses, each a year in length. More commonly, only one semester is available for the type of introductory geography here proposed. Could the year long course here proposed be squeezed into one semester? I belive that it could, particularly by (1) emphasizing lectures more and student problem-solving less, and (2) reducing the number of case studies and/or (3) eliminating Episode E, the Earth as Modified and Modifiable by Human Action. But I am dubious about the wisdom of such a telescoping. There is a strong possibility that it would then be just another lecture-demonstration course of which we already have abundant examples. Still other institutions have only one semester available for all introductory geography, including geography as natural science and geography as social science. Could the course be adapted for the needs of such institutions? It is highly doubtful if this would be practical. Yet segments of the proposed course could be lifted out and placed in a course design appropriate for the needs of such institutions.

Part V. Course Design

The following outline is intended as a general outline or design for the proposed course, not as a lecture guide. Since the course is given to stress problem-solving, the material in this outline should be implemented wherever feasible by exercises, field problems, homework assignments, term projects, discussion, and similar means which actually engage the students in active problem-solving. Those aspects of the course which cannot be well presented in this fashion should be dealt with through appropriate lectures. For example, some topics may prove to be too complex to handle, in the time allowed, through actual student problem-solving; appropriate lectures could save time. In other cases, lectures would be necessary to give structure and coherence to a series of problem-solving situations. The most appropriate balance between problem-solving situations and lectures can only be determined through actual experimentation with the course.

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[24] H. H. McCarty, and J. B. Lindberg, A Preface to Economic Geography (Englewood Cliffs, N.J.: Prentice-Hall, 1966), 261 pp.

For each major segment of the course, the objectives are discussed under two distinct headings: Structural Objectives and Content Objectives. Structural objectives refer to attempts to give the student direct exposure to some particular aspect of the structure of geography (see Part II). Content objectives refer to knowledge of geographic phenomena deemed useful for the student, regardless of its implications in terms of the structure of geography.

A. INTRODUCTION: THE CITY REGION
(approximately 20 per cent of the course)

1. Structural Objectives

The purpose of this episode is to introduce the course through the analysis of the city region, not to present everything there is to be known about cities. The acquisition of specific knowledge concerning cities is subordinated to the more general goal of acquiring ideas and skills useful later in the course. In particular, these include (a) skills in direct observation, since opportunities for experiences in direct observation are at a maximum in this particular portion of the course, (b) skills in the use of simple statistics, air photos (Stone, 10; Wither, 49) and maps; opportunities for the use of air photos and topographic maps are at a maximum in this particular part of the course, (c) understanding of the use of geographic models; opportunities for developing models from observed relationships and/or testing standard models with observed data are at a maximum in this episode (Gregory, 5; Haggett, 7; Yeates, 51), (d) familiarity with the implications of shifts in the scale at which the geographic problem is observed or stated; this theme should run throughout the course but early and repeated experiences are necessary to establish such familiarity; an appropriate experience might be by using a variety of maps of the same city region at a series of different scales, (e) initial experiences with three types of geographic interpretation: areal association, spatial interaction, and regionalizing (Thomas, 11); these types of geographic interpretation should occur repeatedly in the course but early and repeated experiences are necessary to establish full familiarity; except for the regional concept, these terms, as terms, need not be introduced specifically, (f) familiarity with the concept of area studies or chorology; through most of the course the area studies research cluster is subordinated to the spatial research cluster; hence this opportunity to specifically recognize this aspect of geography should not be lost (McNee, 38; Gottmann, 26; Dickinson, 23; Borchert, 19; Bjorklund, 18).

2. Content Objectives

A major objective of this episode is to introduce the course, and hence geography, in the setting most familiar to the student and most directly relevant to the present and future life of the student, the city region. Most students today live in cities and most of them will spend a very large proportion of their lives in cities. Put differently, the objective is to establish an analogue base from which more distant and more complex geographic phenomena can be interpreted.

A related objective is to focus the student's attention on the currently most dynamic element in the global man-land system and the element which is likely to remain the most dynamic during the student's lifetime. In this way he can be made to feel that geographic ideas are indeed relevant to his life and to his future.

A further objective is to provide initial experiences with four major classes of geographic phenomena which form the topical headings for the major subdivisions or episodes of the course: the production system, the culture system, the political system, and the earth as modified by human action. This synthesis, based on a "systems analysis" approach similar to that developed in The Science of Geography, provides unity for the course.

3. Topical Sequence

a. Perception of the Urban Environment

The course should present geography as an adventure in bringing conceptual order to spatially distributed phenomena on the earth's surface. This adventure can be sharpened by experiences which lead the student to understand that (1) he already has a mental image of what a city region is, acquired through past experiences, (2) this mental image of the city affects his behavior and that of others, (3) this mental image is not necessarily the same as that of other members of the class, (4) this mental image corresponds only very roughly to the "real" world or the "observable" world, (5) this mental image is "culture bound," i.e., an image of possible value in understanding a contemporary American city of a size and complexity familiar to the student, but of only limited value and very possibly a handicap in understanding most cities of the past, present, and future, and (6) that this problem of developing a rational and coherent view of the city region is only a special case of a more general problem of geographic perception. An exercise which would achieve these goals involves asking students to draw a map of the city and include whatever they feel is important (Lynch, 33; Price, 43; Wagner, 138). Comparison and analysis of the results can show the diversity and complexity of perception.

b. The City as a Production System (Appelbaum and Cohen, 14; Berry, 15, 16; Carol, 20; Johnson, 27; Karaska, 28; Linge, 30; Logan, 32; Vance, 46)

The production system within the city region should be treated in such a way that the student will begin to understand that (1) the production system can be profitably viewed as a complex spatial web of production/consumption points, lines, and areas linked together by various forms of spatial interaction, (2) such webs are created, maintained, and modified by a continuous and continuing chain of locational decisions by the participants in the life of the city region, (3) the spatial production web can be understood in part by assuming rationality on the part of the decision makers and productive efficiency as the principal goal for the system, and (4) that, though urban geography is in its infancy, existing theories and generalizations can be useful in interpreting urban spatial production patterns, both statically and dynamically; appropriate theories and generalizations include those relating to city growth (input-output analyses; city-forming versus city-serving classifications), models of urban form (concentric rings, sector growth, multiple nuclei, and megalopolis), and the central place concept (simplified form). Gravity models might well be introduced, but, if so, great care should be taken to show their conceptual limitations. Exercises requiring the students to collect data on their own movements and then analyze these movements can be used with great effectiveness.

c. Value Systems and Technology (Chang, 21; Mabogunje, 34; Pred, 40; Price, 43, Ward, 48)

The city should be presented in such a way that the student appreciates (1) that all locational decision making occurs within the framework of a particular value system and a particular technology (cultural relativism), (2) that hence changes in the value system and/or technological system will produce changes in the spatial web of society, including the production web, (3) that urban spatial production systems vary widely around the world, in part because of differences in values and technology, and (4) that though many aspects of the spatial implications of varied value systems and technological systems remain to be explored, existing ideas and generalizations can be useful in interpreting cities today. Ideas which might profitably be introduced could include sequent occupance (possibly applied to several cities of varied types, large and small, successful and unsuccessful, and so on), comparative urban geography (for example, case studies of cities from the Moslem world, China, India, and so on; the objective would be to raise questions as to what kind of generalizations might fit cities in general and what kind would require deep cultural exploration), and the concept of cultural diffusion (for example, this could be developed through case studies of the diffusion of particular street grid patterns (Stanislawski, 45), of the skyscraper idea (Gottmann, 96), or of forms of manufacturing which developed in one city and spread to others; the students could be given the data and asked to analyze the diffusion pattern).

d. Problems of Public Policy (Gottman, 25; Logan, 31; Mayer, 35, 36; Cohen, 115)

The city should be presented in such a way that the student appreciates the importance of political territorialism as a constraint in locational decision making by both public and private groups. Such experiences need not be long or detailed and might be limited to a few case studies of locational conflicts within the city region such as (1) conflicts arising from the territorial fragmentation of metropolitan regions, and (2) conflicts arising from decisions about the location of public services such as schools, hospitals, libraries, expressways, parks, or urban renewal projects. Actual case studies from a recent local conflict on one such question can be highly useful, as student problems.

e. Modifications of Urban Sites (Fenneman, 24; Kiupers, 29; Mayer, 35; McNee, 38)

The urban episode is an excellent place for initial experiences with the general topic of "The earth as modified and modifiable by human action" because such modifications are particularly apparent in city regions. However, there is no necessity to develop this topic comprehensively or exhaustively. The point can be made with a few carefully selected problems or case studies selected from such general topics as flood protection, air and water pollution, the increasing percentage of land covered by concrete or blacktop, or the use of large-scale earthmoving equipment to modify land forms. Issues of conflict and compromise between public and private policy could be explored with great effectiveness. Map exercises in which the student is asked to re-create the original land surface could be used.

f. A Comprehensive View: The City Region

Areal differentiability or chorology is one of the major organizing ideas of geography. A principal advantage of emphasizing it in this part of the course is that no other part of the course has a structure more amenable to its presentation. As the concluding segment of Episode A of this course, it can simultaneously summarize the study of the city region and provide experiences in regionalizing. Case studies requiring students themselves to regionalize are especially desirable (examples: delimitation of a metropolitan region, delimitation of the CBD, delimitation of a "slum" or a "ghetto"). This could be in the form of a map exercise in which a series of maps of the city region were provided and the student was requested to create a boundary and defend it.

B. THE GEOGRAPHY OF PRODUCTION

(approximately 40 per cent of the course)

1. Structural Objectives

A principal objective of this episode should be to bring the student as close as practicable to the research frontiers of one of the four major research clusters of geography: spatial, geometric, or location theory geography. Aspects of area studies geography or man-land geography may also appear but these should appear as appropriate to the elaboration of the spatial research cluster rather than as major topics in themselves. In furtherance of this major objective, there should be an introduction of selected aspects of geographic research methodology as needed in actual problem-solving by the student: geographic models (possibly somewhat more sophisticated than those introduced in Episode A), air photos, common statistical methods, maps at varied scales and of varied types, standard statistical sources, and so on. Locational terminology in common usage or essential to the thought pattern of the course may be introduced (examples: hinterlands, urban networks, central place, manufacturing complexes, interdependence, the urban-rural continuum). There should be experiences with three types of geographic interpretation: areal association, spatial interaction, and regionalization.

2. Content Objectives

The data used to implement the structural objectives above should be selected in such a way as to make clear to the student(s) that (a) he is living in a revolutionary age in terms of the way production is organized and distributed over the earth, (b) that production systems can be illuminated by viewing them as an integrated set of production points, lines, and areas, (c) that such spatial production systems can be examined at various levels of magnitude, from local communities through various levels to the earth as a whole, (d) that such spatial production systems operate as they do because of locational decision making by both individuals and groups, (e) that the degree to which an area is integrated into the larger spatial production whole can be measured and analysed, (f) that today most spatial production systems are highly dynamic so that on the one hand an area may be becoming less well integrated into the spatial whole (i.e., depressed areas are those no longer well integrated into the system) while on the other hand some other area is being "developed" or brought into the system more fully than before, and (g) that the growth of spatially integrated production systems is a major aspect of "Westernization," "urbanization," and "development."

3. Topical Sequence (Garrison, 63, 64, 65; King, 78)

a. Agglomeration versus Dispersion in the Location of Services (Berry and Garrison, 54, 55, 56; Getis, 69; Lukerman, 81; McCarty and Lindberg, 82; Morrill, 83)

The analysis of locations within the production system should begin with services for two reasons. First, because services are most clearly related to urban centers, thus providing a tie to Part A. Secondly, because of the expanding role of services as sources of employment in developed economies. Distinctions should be made between routine services (examples: grocery stores) and highly specialized services such as research centers or managerial decision-making. The problems of the location of services should be presented as a spatial dilemma for society. Thus, on the one hand, there are clear advantages in agglomeration in order to provide a higher level of services. Yet, on the other hand, there are clear advantages in dispersing services so as to be as close to customers as possible, an aspect which is particularly important when those served (such as farmers) are dispersed over wide areas. Existing or hypothetical central place systems could be presented as compromises developed to resolve this dilemma. Concepts such as threshold, range, and hierarchy should be systematically developed. A possible exercise might involve the comparison of "expected" service distributions ("expected" according to some central place model) and "actual" or "observed" distributions in a particular area.

b. Agglomeration versus Dispersion in the Location of Production from Photo-Synthesis (Birch, 57; Dunn, 60; Garrison and Marble, 68; Grotewold, 73; Hoag, 76; Lewthwaite, 79; McCarty and Lindberg, 82; Prunty, 85; Harvey, 74)

Agriculture, per se, should not be one of the major segments of analysis. Rather, a distinction should be made between those types of production which depend directly on the process of photo-synthesis and hence normally require large areas (crop production, commercial forestry, grazing on ranges) and those types of agriculture which do not depend directly on photo-synthesis and hence are capable of being concentrated at points (animal husbandry). Animal husbandry can thus be treated as a special aspect of production from photo-synthesis or can be discussed with manufacturing as a type of processing and fabricating. In any case, production from photo-synthesis should be presented as a spatial problem for society. On the one hand, there are advantages in locating the production of a particular crop with respect to the particular qualities of land (climate, soils, topography, and other qualities) affecting plant growth. On the other hand, there are clear advantages in reducing transport costs as much as possible. Hence some compromise is necessary. Different forms of production from photo-synthesis are affected in different ways by this dilemma. There is competition from the various types of production for the use of sunlight-space. The complex of compromises produces a very intricate and dynamic pattern of land uses. In short, some sort of modified von Thunen analysis could be used, particularly if it were shown that its significance changes depending on the size of the area under consideration and the complexity of its spatial production system (i.e., its level of "development"). A wide variety of problems can be developed from the basic von Thunen formulation; these problems can be at increasing levels of difficulty as additional variables are introduced.

c. Agglomeration versus Dispersion in the Production of Minerals and Power from Wind and Water

Probably this analysis should be quite limited because the theoretical framework for the analysis of the location of such production is today very inadequate. There is no well developed set of location theories for this phase of economic geography. However, there are some challenging questions which could excite the student. The same general dilemma is involved as for the location of services and the location of production from photo-synthesis, i.e., there are advantages in both agglomeration and dispersion. However, mining is a somewhat special case because of the major role played by exploration and the special effects of modern investment practices with respect to mineral exploration. Further, mining is subject to special effects through the economies of scale. Discovery, by the student, of the high degree of concentration of the production of many minerals is much more significant than the memorization of long lists of mineral production points or areas. Problems involving analysis of the more widely dispersed minerals (examples: gravel, limestone) have advantages over those more subject to special geologic considerations (such as petroleum).

d. Agglomeration versus Dispersion in Processing and Fabricating (Alexanderson, 52; Boas, 58; Gregor, 72; Henderson, 75; Estell and Buchanan, 61; Greenhut, 71; Hurley, 77; Linge, 80; McCarty and Lindberg, 82; Pred, 84; Stafford, 87)

Processing and fabricating is here meant to include animal husbandry and handicrafts as well as "manufacturing." Processing and fabricating should be discussed after the previous forms of production because many forms of manufacturing are essentially "product solutions" to locational dilemmas in the production of services, or production from photo-synthesis, and a service may require such large audiences that dispersing it into localities may be ineffective. For example, only larger centers may be able to afford symphony orchestras and consequently people in small centers are too far away to attend. Solution: produce hi-fi records which can be played anywhere. This, in turn, may increase the desire to attend "live" symphonic performances and hence to the development of more local symphonies. Subsequently, the demand for hi-fi records may increase. A time factor is also involved. The hi-fi record can be played at any hour and in any season. Or, a particular crop may be very expensive and of uncertain supply because it is produced in such a distant place. Solution: produce a synthetic product in a manufacturing plant close by. This sometimes leads to a decline in the production from photo-synthesis but in other cases the expansion of demand may buoy the initial type of production, particularly if some value is attached to "natural" products. Processing and fabricating should be presented as a spatial dilemma: agglomeration or concentration has advantages but so also does dispersion. Differing forms of manufacturing are affected differently by this dilemma. Varied linkages between different forms of manufacturing and between manufacturing and services or manufacturing and photo-synthetic production further complicate the pattern. The student hould have experience with both least-cost theories (Weberian theories) of industrial location and maximum-demand theories of industrial location. Manufacturing should be examined at a variety of levels of magnitude, from localities to nation-states and/or the global level. There should be at least one problem involving the location of a very widely dispersed form of manufacturing, such as metal working.

e. The Transport/Communications System and Spatial Interaction among Points in the Production System (Wolpert, 12; Curry, 59; Garrison, 66,67; King, 78; McCarty and Lindberg, 82; Morrill, 83; Taaffe, 88, 89; Thomas, 92)

The whole question of spatial interaction, first examined briefly in Part A, and then developed more fully in the services section of Part B, should now be re-examined on a more refined and more sophisticated level. A major point to be made is that changes anywhere in the production system are transmitted to other parts of the production system through the transport/communications network. A further point is that changes in the transport/communications network will have effects on all points and areas linked by the network. Student problems relating to shifts in the location of production in relation to the interstate highway system could be effective.

f. Informational Feedback and Control of the System (Wolpert, 12; Friedman, 762; Ginsburg, 70; Greenhut, 71; Rostow, 86; Thoman, 90; Thompson, 93)

It should be made clear to the student that the society in question usually will seek to adjust the spatial production system so as to make it more effective in implementing the goals of the society. Such adjustments may involve changes in laws or regulations governing the system or they may involve the development of new space-adjusting technology or resource-converting technology. However, the feedback of information about the functioning of the spatial system is always imperfect because of imperfections in communications technology and because of the screening effect of the value system and limited perception of the society. Thus, this concluding portion of Episode B can be used to summarize and, at the same time, to raise some challenging questions concerning the quality and quantity of the data now available on the spatial dimensions of production systems and concerning the presently imperfect state of our understanding of how spatial production systems actually operate. This is also the place to raise again the question of perception of environment initially raised in Episode A.

C. SPATIAL PRODUCTION SYSTEMS IN HISTORICAL-CULTURAL CONTEXT (approximately 10-15 per cent of the course)

1. Structural Objectives

The principal objective of this episode should be to bring the student as close as practicable to the research frontiers of spatial geography, though man-land geography and area studies geography may appear as more significant sub-themes than in Episode B. The research techniques and methodology of geography should be introduced as relevant to actual problem-solving by the student. Additional geographic terminology may be introduced as essential to theme development but in most cases the terminology used should be that already introduced in Episodes A and B. There should be experiences with three types of geographic interpretation: areal association, spatial interaction, and regionalization. Globalism as a geographic value may be given somewhat more expression than in Episode B, through the examples chosen to illustrate the theme of spatial production systems in historical-cultural context.

2. Content Objectives (Hodder, 97; Isaac, 98; Lowenthal and Price, 99; Mayfield, 100; Meinig, 101; Mikesell, 103; Skinner, 106; Spencer and Horvath, 107)

The theme should be developed in such a way that the student will understand that (a) the cultural system (i.e., the value system and the technological system) acts as a powerful constraint on the development of spatial production systems, one aspect of this being the role of culture in environmental perception, (b) cultural systems normally develop slowly, over long periods of time, (c) cultural systems are "place bound" to a high degree, i.e., they have discernible points of origin on the earth's surface and varying rates of spread outward from such points of origin, (d) expanding spatial production systems are powerful forces for the breakdown of old culture systems in their path, (e) some culture areas may reject "progress" (i.e., integration into an expanding spatial production system) in order to preserve existing cultural unity, and (f) zones of culture contact may have stratified production systems (i.e., two spatial production systems, one linked to a larger spatial production system extending beyond the area, and the remnants of an older spatial production system still oriented to the area itself).

3. Topical Sequence

a. Comparative Production Geography of Selected Great Civilizations

A broad general distinction should be made between those cultures which developed "civilization" and those which did not. Civilization is here defined in the classic sense of a finely elaborated spatial production system with a network of cities, towns, and villages linked together by a transport-communications system. Two or three selected examples of the ancient civilizations (examples: Maya, Inca, Greco-Roman, Moslem, Chinese) should be analysed in terms of (1) similarities and differences in the spatial production system, and (2) points of origin, rates of spread, and zones of culture contact for the system.

b. Origins and Spread of the Occidental Production System

"Western Culture," the "Industrial Revolution," the "Commercial Revolution," the "Agricultural Revolution," and "Urbanization" should be examined in terms of the significance of space-adjusting and resource-converting techniques and methods developed over the last century or two. The emphasis should not be on the technological changes, changes in forms of socio-economic organization, and changes in values as such but rather on the freedom these changes gave to develop new spatial production systems. The effect of new transport technology in changing the perceptions of distance could be treated. The origin and spread of the Occidental system from Western Europe to large parts of the earth should be analysed. This should be followed by selected case studies of examples of resistances to the spread of this spatial production system and the values associated with it by both peoples of European origin (possible example: the Pennsylvania Dutch) and by non-European peoples (noteworthy example: China). Finally, the present-day world-wide problem of economic development could be analysed as a basic dilemma. On the one hand, the spread of the Occidental spatial production system is associated with rising living standards and greater material well-being except in those cases in which population growth has outrun the elaboration of the production system. On the other hand, the decline in isolation associated with the spread of the Occidental production system is allowing the erosion of old value systems and is tending toward the creation of a single world-wide value system. The erosion of established value systems can be quite traumatic, both for individuals and whole societies. All peoples, Americans included, face this basic dilemma. Many possible student problems suggest themselves. For example, students could be asked to plot the global diffusion of printing, Sabbath observance, farm machinery, or autos. The students could then be asked to analyze the meaning of this spread for a particular culture.

D. SPATIAL PRODUCTION SYSTEMS IN THE CONTEXT OF POLITICAL TERRITORIALISM

(approximately 10 per cent of the course)

1. Structural Objectives

The principal objective of this episode should be to bring the student as close as practicable to the research frontiers of spatial geography, though area studies geography and/or man-land geography may appear as significant sub-themes. The research techniques and methodology of geography should be introduced as relevant to actual problem-solving by the student. Additional terminology may be introduced as essential for the illumination of political territorialism but in most cases the terminology already introduced in Episodes A, B, and C should suffice. There should be experiences with three types of geographic interpretation: areal association spatial interaction, and regionalization. Globalism as a geographic value may be given somewhat more expression than in Episodes A and B through the selection of case studies to be analyzed but there should be no attempt to analyze the political territorial framework of the earth as a whole in any detail. Globalism could be expressed especially in terms of global spatial interaction patterns. Localism could also be expressed, particularly in terms of the spatial expression of legal patterns. The relation of legal localism and global spatial interaction could be developed.

2. Content Objectives (Chang, 114; Cohen, 115; Herman, 117; Lowenthal, 120; Robinson, 126

Political territorialism should be developed in such a way that the student understands (a) the role of territorial limits in constraining the elaboration of a spatial production system, (b) the role of the spatial production system as a unifier of a territorial state, (c) the role of the territorial state as a positive force in the elaboration of spatial production systems, (d) the potential conflict between desires for unity (based on areal homogeneity of culture) and desires for power and economic well-being (based on a spatial production system unrestricted by the areal differentiation of culture), and (e) the potential conflict between desires for military security and desires for productive power (based on the unrestricted development of the spatial production system).

3. Topical Sequence

a. Comparative Spatial Integration within Territorial States

Selected territorial states should be analyzed in terms of the degree to which their territory forms a spatially integrated whole. Indices of national cohesiveness could be developed. These case studies should be selected with a view to bringing out the varying degrees of spatial integration observable, particularly in relation to (1) the nature of organization of the territorial state such as the federal state versus the unitary state (example: France versus Switzerland), (2) the degree to which the spatial production system has been elaborated (i.e., the level of "economic development," "urbanization," "technology," "education," and so on), (3) the size of the state, (4) the cultural areal differentiation of the state (examples: language diversity), (5) the obstacles to areal integration posed by earth features such as deserts, mountains, or thinly inhabited areas. (6) the origins of the state (i.e., did it originate as a mere instrument of administrative convenience for occupying powers?) and the purpose of existence of the state. The students themselves should be asked to draw conclusions from case study evidence made available to them.

b. Comparison of the United States and the Soviet Union

This should be an analysis of ways in which the spatial production systems of the two countries function similarly and also of ways in which these systems function differently because of differences in territorial political structure. Having had many previous experiences in problem-solving, the students should be able to do much of this analysis themselves, with help on gathering data.

E. THE EARTH AS MODIFIED AND MODIFIABLE BY HUMAN ACTION (approximately 10-15 per cent of the course)

1. Structural Objectives

One of the basic assumptions of this course is that the authors of The Science of Geography are correct in defining the most general of all geographic problems as a search for "a full understanding of the vast, overriding system on the earth's surface comprised by man and the natural environment.[25] A further assumption is that educational efficiency is enhanced by having two parallel introductory geography courses, one a behavioral geography course such as this one, stressing spatial geography but including area studies geography and man-land geography as sub-themes, and the other a physical geography course stressing physical geography for its own sake but including spatial geography and man-land geography as sub-themes. Accordingly, the primary purpose of Episode E of this course is to simultaneously bring the student as close as practicable to the research frontier of man-land geography and to build a bridge to the parallel course, physical geography. The research techniques and methodology of geography should be introduced as necessary for actual problem-solving by the student. It would be necessary to introduce some terminology from man-land geography and physical geography not previously introduced. It is probable that general terms such as environment, habitat, and eco-systems would be introduced for the first time in Episode B and then more fully developed here, in Episode E. The introduction of more specific new terms here in Episode E should be held to a minimum and, wherever possible, analogies to terms already used should be indicated. There should be experiences with three types of geographic interpretation: areal association, spatial interaction, and regionalization. The geographic value, globalism, should be given full expression through treatment of the earth as a single, unitary, object on which a variety of systems operate. The geographic values of earth reverence and the unity of man and nature could be given expression here, especially if in the form of the conflict between this value and the "conquering of nature" view.

2. Content Objectives

The theme should be treated in such a fashion that the student understands (a) that the earth has been modified by man in a variety of ways over a very long period of time, (b) that some of these changes occur rapidly and are rather obvious whereas others occur slowly and are difficult to observe closely, (c) that some of these changes appear to be irreversible, so that each new generation faces a different earth environment, (d) that some parts of the earth have already been modified very extensively while other parts have been modified only very slightly, (e) that each step in man's development of space-adjusting and resource-converting techniques has increased man's power to modify the surface of the earth.

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[25] Ad Hoc Committee, The Science of Geography, p. 8.

3. Topical Sequence

a. Gross Areal Variation of the Earth's Surface

This section should merely present the general findings of physical geography about the earth's surface, particularly through some general regional classification system of land groups such as that of Preston James. This could be done largely in a problem-solving context. That is, the students could be given both specific data and several alternative regional classification systems and asked to develop their own regional system for the earth.

b. The Earth as Modified by Human Action in the Pre-Industrial Age (prior to 1750 A.D.) (Gould, 132; Thomas, 137)

This should include case studies in modification in which the student is asked to evaluate the extent and significance of the modification. It might include examples involving fire, the plow, and grazing. There should be an analysis of the significance of such modification for each of the land groups and, through this means, of those parts of the earth most modified and those parts least modified. Student problems might well be based on the use of primary historical data such as John Smith's description of Virginia.

c. The Earth as Modified by Modern Spatial Production Systems (Bowden, 128; Burton and Kates, 129; Nelson and Byrne, 134; White, 139)

This should include case studies of forms of modification different from those of preceding historical periods, such as the new role of earth-moving equipment or the expanding role of insecticides, pesticides, and herbicides. The concept of environmental perception should be re-introduced in this context. It should include an analysis of which parts of the earth have been most modified and those least modified. This might involve the preparation of world maps by the students, after reading and/or discussion of the characteristics of particular technologies and particular land areas, or student problems at larger scales.

d. How Modifiable is the Surface of the Earth?

The students should be challenged to analyze how the spatial production pattern of the earth might be altered by hypothetical developments in space-adjusting or resource-converting technology. For example, how might the world-wide spatial production pattern be altered if (1) means were developed for converting salt-water to fresh water at rates low enough to permit widespread use for irrigation, or, either separately or concurrently, (2) transportation of water by pipelines were reduced to a fraction of present costs? There might be considerable disagreement among the students on this question. Students should be encouraged to bring in more and more variables.

F. SOME UNANSWERED QUESTIONS ABOUT HUMAN GEOGRAPHIC BEHAVIOR

(approximately 2 per cent of the course)

Episode F is intended as a "threshold" experience, to use Bill Pattison's phrase. That is, it is intended as a capstone or summary and yet more than that. It is intended to point forward as well as backward. It provides an opportunity to summarize what has been learned about the structure of geography or the geographer's way of knowing. At the same time, it provides an opportunity to raise questions about what could be know about geographic behavior and some hypothetical ways to go about trying to probe such unanswered questions. Insofar as practicable, such summarization and probing should be done by the students themselves. The basic question for the student to ask himself is this: what can I now do that I could not do before taking the course? How might such abilities be used to go on learning, whether in a geography course or not?

G. SELECTED REFERENCES FOR IMPLEMENTING THE COURSE DESIGN

This list stresses recent articles in geographic journals and recent geographic monographs. "Recent" as used here means published within the last decade. Anyone wishing to implement the course design in whole, or in part, should also consult recent geographic text books, paperbacks, reprint series (such as that of Bobbs-Merrill), older geographic articles and monographs (it is assumed here that older sources are widely known to the readers of this outline), atlases, map sources, air photo sources, statistical sources, and so on. This list is intended primarily to clarify the course design for the teacher and secondarily to provide source material for actual implementation.

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THE WORLD REGIONAL GEOGRAPHY COURSE: ALTERNATIVE APPROACHES

by

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Contents Page

Preface and Acknowledgements. 40

I. The Purpose of this Project 41

II. The World Regional Geography Course as a General Liberal Education Course in Undergraduate Curricula 42

III. A Conceptual Framework for World Regional Geography Courses of Varying Lengths 45

IV. Topic Sequences for World Regional Geography Courses of Varying Lengths 50

V. Consideration of Teaching Strategies Appropriate to These Courses 72

VI. Bibliography for These Courses 73

VII. Other Approaches Available in Textbook Form 86

PREFACE AND ACKNOWLEDGEMENTS

When, at the request of the Commission on College Geography, I began to consider the task of designing "a fresh approach to teaching World Regional Geography", I did not feel like an explorer. But since September 1965 I have been embarked upon adventure—intellectual and behavioral—which has always been stimulating and seldom routine. As I write this preface, trial teaching of the course outline is half accomplished and I have reached the clear realization that the goal of the project is the journey itself. Course design consists of initial organization and continuing revision (perhaps the word should be revitalization) if the sense of adventure is to remain. With these remarks, this course outline is published as a point of intellectual embarkation from which I hope that teachers will, by selecting appropriate ideas, chart their own paths through the academic term.

I should like to emphasize the tentative, experimental, quality of this work. One of the felicitous conditions of intellectual exploration is that it is possible to retrace one's steps and begin again on a different path. The first semester of the outline has been reworked after being taught; the second semester has not yet benefited from practical application in the classroom. The Commission, however, felt it timely to publish this outline with three others as points of departure surely to be revised by experience. I would welcome the opportunity to draw on others' experiences as well as my own. So I would appreciate receiving reactions and suggestions that are generated either by reading this outline or by putting some of its ideas into practice.

I should like to acknowledge my gratitude for the help of many geographers in this project. Chief among these are the members of the Commission's Subpanel on a World Regional Geography Course, Chauncy D. Harris, Norton S. Ginsburg, and Fred Eggan. Their continuing guidance, and especially that of Chauncy D. Harris, made possible the fruition of this project. John F. Lounsbury, Director of the Commission of College Geography, has ably provided the administrative support necessary. The members of the Commission on College Geography, both regular and ex-officio, have perused several drafts of this outline and have generously offered comments and encouragement. Also, colleagues at the University of Michigan, Michigan State University and elsewhere have generously read and commented upon specific topics; they are John F. Kolars, Brian W. Beeley, Elmer A. Keen, Melvin G. Marcus, Douglas McManis, John D. Nystuen, Ross Pearson, Lawrence Sommers, Waldo Tobler. Needless to say, I alone am responsible for the content of the outline as here presented.

Thanks to the good offices of Nicholas Helburn, I have been able to consult with the staff and writers of the High School Geography Project, continually an intellectually invigorating experience.

Finally, I must express deep gratitude for the secretarial efforts of Marguerite Landman without whose unfailing help and good humor I would have capsized long ago.

Ann E. Larimore
Ann Arbor, Michigan

31 December 1966

THE WORLD REGIONAL GEOGRAPHY COURSE: ALTERNATIVE APPROACHES

I. The Purpose of This Project

The devising of a fresh approach to teaching World Regional Geography grows out of the concern of the Commission on College Geography for an introductory undergraduate course which would provide

> ..an effective mode of analyzing and comparing domestic and foreign areas,...a knowledge of disparate peoples, and cultures; an appreciation of the diversity of the world in terms of its physical makeup and resources, cultural evolution, economic development, and political and cultural ties, as well as the common threats and dangers that affect the nations of the world and that touch off changes in area interrelationships.[1]

Such a course has been considered here to be introductory in the sense that it is designed to acquaint students with geography as a way for viewing the world rather than being introductory in the sense of serving as an introduction to geography as an academic subject and a professional discipline.

This attempt at a fresh approach is designed to complement approaches already available in materials such as texts, traditionally the means by which new conceptualizations of World Regional Geography have been disseminated to the profession. It has been designed within broad guidelines set by the Commission for a world regional geography course, two semesters in length, considered as a liberal arts college course which would treat the whole world rather than selected regions.

The essential features of this approach may be summarized as follows:

1. The course focuses upon the global unfolding of universal geographical processes.
2. Individual areas are seen as components of a single world system.
3. No attempt has been made to compartmentalize the world regionally. Rather, regions are viewed as logically defined spatial pnenomena developing from the interaction of geographical processes.
4. The migration of culture groups and their successful occupance of their selected habitats through the use of specific types of spatial organization and resource use systems provides a rigorous organizing theme for selection of subject matter.
5. Some areas are treated twice and some are not treated at all, whichever is consistent with the organizing theme.
6. The course expects to reflect recent theoretical advances in interpretation of data.
7. The content of the course may be embodied in a particular teaching strategy featuring lectures as the means of providing basic continuity

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[1] The Commission's concern follows upon that of the Geography in Liberal Education Project reflected in "Guidelines", Geography in Undergraduate Liberal Education. A Report of the Geography in Liberal Education Project, (Washington, D.C., Association of American Geographers, 1965), p. 7. Such a course would necessarily reflect the fundamental emphases and types of minimal factual knowledge discussed in pp. 4-5 of "Guidelines."

of subject matter, visual sources of data used extensively in presentation of subject matter and reliance upon an atlas for basic reference and assorted materials for student readings, not upon a textbook.

8. The course is conceived to be a general liberal education course, an "elective" or "distribution-satisfying course" rather than the first course in a geography major sequence.

II. The Place of the World Regional Geography Course as a General Liberal Education Course in Undergraduate Curricula

1. World Regional Geography's Contribution to College Curricula: – When developing a world regional geography course, internal conceptual structure and factual components cannot be considered alone. It is just as necessary to assess the role of the course in undergraduate education so that the course's internal rationale will be consistent with its general educative purpose. Rather than treating the importance of world regional geography to undergraduate education as a whole, the specific relationship of the course to various undergraduate curricula such as Liberal Arts, Education, Pre-professional and other curricula, will be discussed here. The former topic has already been definitively treated by Chauncy D. Harris in "The Geographic Study of Foreign Areas and Cultures in Liberal Education".[2] Harris' article although not specifically concerning world regional geography course is very pertinent. Moreover, while written about liberal arts education, his comments also apply more widely to other types of undergraduate education and especially, it seems to me, to teacher education.

Harris succinctly states the general educational aim of a world regional geography course in the following paragraph:

> A liberal education should develop in each individual the realization that his own country, region, and ethnic, religious, or linguistic group is but one among many, each with differing characteristics, and that other countries, regions, or social groups are not necessarily queer, or irrational, or inferior. It may be argued that one cannot see his own country and culture in perspective until he has studied other lands and peoples. Only then can one realize that his own civilization is but one of a family of civilizations with common elements yet distinctive characteristics, evolving through time from common antecedents with differentiation but with much cultural borrowing, facing similar problems yet with particular combinations of attitudes, policies, technologies, climates, soils, minerals, and evolved economic systems.[3]

A single course in world regional geography cannot alone accomplish this aim. It can, however, be a major contributor to the cultivation of a realistic and rational world view. We humans are, as yet, bound to the earth's surface for our life spans. We need the ability to place our personal situation in its proper position within the geographic systems of the global surface we inhabit. Yet nowhere in the undergraduate curriculum save in a world regional geography course or in a world patterns course may a student learn the global system of occupance of which he is inevitably an interdependent part.[4]

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[2] Chauncy D. Harris, "The Geographic Study of Foreign Areas and Cultures in Liberal Education," Geography in Undergraduate Liberal Education. A Report of the Geography in Liberal Education Project. (Washington, D.C., Association of American Geographers, 1965), p. 25.

[3] Ibid.

2. *What Kind of Introductory Course is World Regional Geography?* – From discussion with geographers in various colleges and universities about the appropriate place for a world regional geography course within their Departmental offerings, several pertinent observations may be recorded.

Despite the desire that students selecting Geography as a major possess an adequate factual background[5] upon which to base their study of geography as an intellectual endeavor and discipline, there seems to be a trend toward abandoning World Regional Geography as "The Introductory Course for the Geography Major". In some cases, such a course is not even taught within the Department, its place being taken by a plethora of courses each concerning a single region. Where World Regional Geography has been maintained, it has often been fitted in by being shortened into a one-quarter or one-semester course and assuming more of the character of a World Patterns course. More and more, the Introductory Course referred to above seems to be systematic in nature, concerned explicitly with analysis of spatial process and spatial relationships and assuming (or at least hoping for) the formation in the student's mind of a detailed global distribution map of the most important geographic features as an incidental by-product. Where does this trend leave World Regional Geography?

It seems appropriate that World Regional Geography should be considered a liberal education course rather than an introduction to the discipline of geography as an intellectual endeavor. While the purpose of "The Introductory Course to the Major" is to begin explicitly to train the student as a practicing geographer (to which end no doubt, it should include a section on the regional method), the aim of the World Regional Geography course seems rather to be the display of geography's cumulative achievements in ordering and analyzing the arrangement of phenomena on the earth's surface. The two courses then accomplish different purposes. If World Regional Geography is a necessity for the Geography major's liberal education, it also seems to be just as necessary for any internationally-oriented student majoring in a social science as well as for would-be primary school teachers and secondary social studies teachers. A forceful argument can be made for its necessity to any student who wishes to be a responsible citizen well-informed about world affairs.

The World Regional Geography course thus presents the intellectual achievements of geography in rationally ordering the diversities of the earth's surface. Every effort should be made to incorporate the discipline's latest advances both in methodology and regional knowledge. As Meinig says of the Syracuse University course, "The primary purpose is to introduce the student to the world through certain perspectives of the geographer".[6] The World Regional Geography course is not designed primarily to be an introduction to geography as either an academic subject or a profession. Wheeler speaking of the University of Missouri course comments that such a course "is not a 'preparatory' type of course teaching geographical elements, principles, methods, and theories on the assumption that these will be put to use in later geography courses. ... the course is self-contained".[7]

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[4] Thus this single course reflects within the constraints of the college curriculum's structure of credit hours, class schedules, and grade points, the general geographic aim of "an understanding of the vast interacting system comprising all humanity and its natural environment of the surface of the earth". Edward A. Ackerman, "Where is a Research Frontier?" Annals of the Association of American Geographers, LIII. (December 1963), p. 435.

[5] "Guidelines", Geography in Undergraduate Liberal Education, p. 5. This factual background is outlined as:

1. a systematic knowledge of the basic distributional character of such world-wide phenomena as climate, cultural systems, population, and resources;
2. a knowledge of the processes responsible for the spatial distribution and variable character of selected landscape features; and
3. a more detailed knowledge of a selected number of individual areas illustrating typical or atypical conditions.

This course therefore is to be a liberal education course in the true sense of the term. From it, as effectively as present geographic knowledge and skills allow, the student should receive a vivid presentation of the conditions in his own and other resource utilization systems, especially of their establishment, maintenance, and adaptive change. He should leave this course stimulated to explore the intellectually unknown as well as to experience hitherto unseen places.

3. World Regional Geography's Position in College Curricula: – But if this course's aim is primarily to provide general education, how can it be fitted into the various university and college curricula? Implicit in the above discussion of the course's role seem to be the following characteristics: it is a self-contained course needing no prerequisites; it can profitably be taken by Geography majors and non-majors alike; it does not occupy a particular niche in a sequence of courses but can be taken before, after, simultaneously with, or apart from other Geography courses. Nevertheless, it should be helpful to indicate two academic levels to which the course seems particularly fitted and indeed, at which it is often taught.

One may argue that a college student should come to Geography, Education, or several other majors (mostly in the Social Sciences) with knowledge of the basic global distributions of geographic features formed by interacting causal processes and often associated in regions. If so, the appropriate place for such learning is probably the last years of high school and the first years of college. (Of course, due to the variation in standards in American school systems, these are overlapping levels.) This level I think appropriate because reasonably this should be the level at which the student begins to think globally as well as nationally. I therefore can imagine World Regional Geography as a freshmen-sophomore level course taught as an elective or as a "Social Science Distribution-satisfying course" by which we might hope that students would subsequently be stimulated to take the course considered to be the introduction to a Geography major. This level of World Regional Geography course would be attractive to students from majors such as Education, Nursing, Journalism, and other pre-professional training where social-science electives are required.

World Regional Geography should not be confined to the lower level of college courses, however. Perhaps the most challenging type of World Regional Geography course which might be taught would be a junior/senior/beginning graduate-level course which would assume of its students an international orientation and some social science sophistication. Such a course would be a free elective able to satisfy Social Science distribution requirements but relying primarily upon drawing students from major fields related to Geography who wished to experience an intensive global survey of geographic phenomena and processes. This level of course would be more appropriate for Social Science majors, students preparing for area specialties, and probably Geography majors. This level might also be more appropriate for secondary school social studies teachers.

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[6] Quoted from D. Meinig's course syllabus as submitted to the Commission on College Geography, September, 1965.

[7] Quoted from J. Wheeler's course syllabus as submitted to the Commission on College Geography, September, 1965.

How do these two World Regional Geography courses relate to one another? I think that their conceptual structure would be the same but that since they are directed toward different audiences the levels of intensity, factual detail, and the level of competence, amount and type of work required of a student might differ. Both courses would be designed, however, for geographical neophytes, a characteristic perhaps more important than the level of general academic sophistication. Thus, to reach a senior history major whose mind has been bound to chronological methods of analysis might be more difficult and time-consuming than reaching the freshman "who never wrote a term paper in high school".

To summarize: World Regional Geography is an essential ingredient in a student's liberal education, especially if he is a geography, social science, or education major. Such a course may appropriately be offered at two levels during college and university and would have conceptual unity although differing levels of complexity. Such a course would not be considered to provide "The Introductory Course to the Geography Major" but might perhaps be a necessary prerequisite for completing the major.

Among Geography course offerings, the World Regional Geography course would assume the responsibility of providing a global summary of geographic processes as they are manifested in regions. It would characteristically be presented as a summation of geographic achievement, both conceptual and factual, and would aim to lure students (whether freshmen or seniors) into further study of geography by chronicling the orderly development of the world's geographical systems as well as by sensitizing the student's perceptions to aspects of life and landscape hitherto unobserved.

III. A Conceptual Framework for World Regional Geography Courses of Varying Lengths

1. The Course's Conceptual Base: Regions as Manifestations of Process: - Although a world regional course may be organized in several ways—as a survey of world patterns, as a systematic introduction subsequently illustrated by selected regional coverage, as an orderly exposition of current geographical facts regionally arranged, as a sequential survey of one particular set of regions on the earth's surface—this course espouses a different conceptual organization. This course is based on the concurrent analysis of the development and persistence of regions formed by the interaction of universal geographic processes. The course directs primary attention to three kinds of regions, all products of human behavior interacting with the natural environment: those resulting from 1) the innovation and diffusion of cultural patterns, 2) the functioning of areas of organization, 3) the operation of resource utilization (livelihood activities) systems.[8] Such regional analysis must necessarily treat causative geographic processes so that the student appreciates their

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[8] Thus this course aims for the synthesis suggested by Robert S. Platt in "The Rise of Cultural Geography in America" Proceedings of the Seventeenth International Geographical Congress Washington, D.C., 1952 (Washington, D.C., n.d.), pp. 485-490 when he writes:

> All culture has developed and continues to grow in the functional pattern of active human enterprise. And all human enterprise functions through the medium of culture. Full understanding involves both aspects. Geographers undertaking study in an area now commonly seek answers to both kinds of questions: (1) What is the functional pattern of

(continued on next page ....)

continuous operation through time as well as the varying current manifestations of their global nature. Each process would not necessarily have equal priority for discussion but nevertheless each warrants inclusion. To provide an explicit conceptual overview for the course, these processes would be treated systematically and their global patterns would be described at the beginning of the course.

The region has consistently been used as a prime organizing concept in teaching geography. This course aims to integrate the concept of the region and the concept of geographical processes by using only regions which may be identified as resulting from the interaction of specific processes. Regions thus are areas defined by the occurrence of a measurable concentration of phenomena (uniform/homogeneous/formal regions) or by a measurable focusing of movement flows (nodal/functional regions).[9] Such concentrations whether of specific phenomena or of focused movements are considered to be always in a state of change so that regions are not static nor necessarily enduring phenomena. Such regions thus may be considered to form, persist, and possibly to disintegrate; consequently, they may be genetically analyzed. The conceptual basis for the intellectual organization of this course is to be found in this process of regional formation by the global interaction of geographical processes.

2. The Processes of Regional Formation: – The following processes are essential for inclusion. First are three human processes which directly generate the three broad categories of geographic region indicated above. In sequence, they represent interdependent processes operating at different, and generally decreasing, areal scales.

2-A The cultural differentiation of Homo sapiens through migration, the independent development of population groups, and the process of culture change.

2-B The location, operation, and development of systems of territorial organization which unify areas for various purposes. Two significant types of areal organization would be emphasized: 1) that facilitating political unity (primarily, the nation-state system; secondarily, tribal organization, feudal and imperial dynastic organization) and 2) that necessary for resource utilization (e.g., units of occupance, villages, and central places, cities with their hinterlands).

2-C The location, operation, and development of differing resource utilization systems by population groups utilizing culturally specific technologies to exploit specific ecological systems and environmental cycles through seasonal activity patterns.

Footnote 8—continued

human enterprise going on in this environment, and (2) What is the cultural origin of this way of life? . . . These questions do not imply a permanent dichotomy between functional organization and cultural origin. On the contrary they are directed toward the understanding of a single phenomenon: human occupance in its earthly setting, carried on by people who have drawn upon their heritage of equipment from the past to make themselves at home in the present in the place where they live, a functional-cultural pattern in space and time, a coherent dynamic entity in the multidimensional spatial-temporal frame.

[9] This definition follows strictly that of Derwent Whittlesey, pp. 31-40 in American Geography: Inventory and Prospect, Edited by P. E. James and C.F. Jones (Syracuse: Syracuse University Press, 1954). The terms "area" and "region" are therefore not used interchangeably here.

Operating concomitantly are two physical processes which must be treated in detail if the formation of regions is to be adequately analyzed.

2-D The global variation of climatic conditions (both temporal and spatial) which are produced by the interacting patterns of atmospheric circulation, latitudinal or altitudinal temperature variation and land and ocean distribution.

2-E The dependent variation of soil and vegetation which results from the interaction on a smaller areal scale of climatic processes with lithic and biologic processes.

3. The Formation of Contemporary Regions: – Resulting from the simultaneous operation of the above universal processes are specific subsidiary processes which have operated to develop identifiable contemporary regions on the earth's surface. The rate of operation of these processes varies markedly from site to site so that formation, persistence, and decay of consequent regions varies accordingly. The subsidiary processes would merely be identified in the introductory systematic section of the course. The manner of their operation would, however, be made clear during the areal treatment which would constitute the bulk of the course.

3-A The increasing areal concentration of the world's rapidly growing population.

3-B The increasingly efficient and all-pervasive political organization of the earth's surface by means of the nation-state in order to apportion control of natural resources among human groups and to allocate power among individuals to provide the peace necessary for effective resource utilization.

3-C The succession of one set of resource utilization systems for support of human populations by another set because of human migration, conquest, innovation, and acculturation.

3-D The much slower process of natural change in physical site conditions and the acceleration of such change by human intervention.

3-E The development of settlement hierarchies through trade and transportation activity and political centralization.

3-F As the most recent and spectacular example of such development, the expansion of a world-circling market economy because of scientific and technological innovation especially of techniques of controlling increasing volumes of energy conversion, of overcoming the friction of space, and of increasing productivity of material wealth.[10] This expansion is seen as concomitant with the spread of nation-state system, the growth of population and of cities, and the diffusion of standardized cultural patterns.

4. The Aim – Demonstrating the Orderliness of Geographical Process: – The aim of this World Regional Geography course is to demonstrate that the geographical processes which underlie the seemingly infinite variety of phenomena spatially associated on the earth's surface operate in an orderly, universal,

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[10] This particular process seen particularly in terms of individual regions' increasing connectivity into a world system serves as the organizing theme for a World Regional Geography course newly developed at Southern Illinois University. Robert A. Harper sets forth this course's rationale in "Geography's Role in General Education," Journal of Geography, LXV, (April 1966), pp. 177-185. Harper's conceptual argument is significant as an example of a particular direction taken in developing the aims Harris had stated (Harris, op. cit.).

and discernible manner. The earth's geographical variety represents only the current stage of development reached by identifiable processes operating interdependently through historical time. From this course, the student should learn to appreciate that the human population is composed of people concerned, as he is himself, with common problems of livelihood continuity and change although cultural patterns, physical appearance, and environmental situations may vary widely from group to group.

This conceptual framework provides a logically defensible philosophical basis for inclusion of specific subject matter in the World Regional Course. This basis is of central significance to the perennial problem of how to select and organize the very small proportion of geographical information about the world which can be included within a single undergraduate course. The underlying goal of such an approach is to present the student with a rational set of concepts empirically verified with which to explore more effectively the world and his place in it. Specific facts can always be learned but facts may be arranged in more or less meaningful patterns only on the basis of conceptual insights by the arranger.

5. Geography – A Unified Discipline: – The idea of geography as a unified discipline is basic to this course's conceptualization. The pedagogic separation of physical geography from human geography seems defensible only at the advanced teaching level (if then) and only as preparation for specialized research competence. In this course, human and physical processes are conceived of as operating simultaneously in parallel ways to create the unified geographic totality perceivable as the earth's surface. A portion of this geographic totality as customarily defined is the landscape, the visible manifestation of the operation of interdependent human and physical processes. In the landscape it seems logically impossible to separate "cultural features" from "physical features" since neither category exists independently in reality. Consequently, this course will not present physical geographic material as the "setting" in which cultural features are placed and human activities "unfold". Also to be avoided is an inventory approach where "physical features" are placed in one section as prelude to the treatment of "cultural features" in another.

At least as important as visible landscape features, moreover, are the ubiquitous invisible manifestations of operating processes such as seasonal work cycles and movement vectors. If landscape were viewed as comprising more than "the visible landscape" and the term used as a synonym for the observable geographic totality of any area (much of which is only fleetingly or indirectly visible), could not landscape observation and analysis usefully serve as an initial approach to consideration of more complex geographical patterns, especially as the point of entry into the analysis of more abstract spatial patterns such as are furnished by maps? Pedagogically, this would seem to be a useful method of initiating or introducing the student inexperienced in geography into what Robert McNee calls "the geographer's way". Landscape could then be considered as a primary indicator of the operation of geographical processes in two meanings of the word primary; that is, primary as "introductory or preparatory to something higher" as well as primary in its meaning of "principal".

Landscape analysis is also useful as a surrogate of geographical change since visible changes in landscape patterns reflect changed resource utilization and spatial organization. As used in this course, landscape analysis and observation may be considered as a method to attain the course's objectives rather than as an end in itself and as a method particularly pertinent to the course's pedagogical aim of placing strong emphasis upon the use of varied visual materials as a core source of data for the student.

6. Uniqueness and Universality: Inseparable Concepts: – It is expected that explicit conceptual models could be used especially in the systematic introduction to the various processes. The primary consideration of universal processes need not mean, however, that the "uniqueness of place" would be totally neglected. There is a tension between the concepts of universality and uniqueness that we cannot escape; rather a balance must be attempted. Certainly, the truly unique can never be recognized unless the universal features of the place or situation have previously been identified. These observations also pertain to the problem of similarities and diversities between places since the degree of diversity can be determined only if the extent of similarity can be measured.

7. Global Coverage Necessary: – In order to utilize a conceptual framework of interrelated processes systematically and to show their unified universal manifestations on the earth's surface, this world regional geography course commits itself to cover the globe – to treat the entire surface of the earth – land and ocean – as a unified surface though with varying comprehensiveness and detail for specific areas. I do not mean that it is necessary to mention every political unit on Earth or every mountain range. But to carry out the aim of presenting the regions manifested by universal geographical processes, a commitment to consider those regions as products of a global system is necessary. A major result of comprehensive coverage which careful regional sampling cannot give fully is to underscore the orderly universal operation of interrelated processes as similar patterns (e.g., central place hierarchies, rain-shadow deserts) are repeatedly observed. No other experience, it seems to me, will convince the student of the rationality of geographical processes and therefore of the real possibilities for prediction in geography.

8. An Interlocking and Logical Areal Sequence: – The areal sequences used for presentation throughout the course must be logically defensible. Several readily perceived alternative regional sequences used in the past have usually compartmentalized the earth's surface: culture regions, physical (usually climatic) regions, composite or "natural" regions, country-by-country or continent-by-continent sequences. The organizational framework of this course, however, has been based on the orderly unfolding of universal geographical processes which ultimately form regions, not on a sequence of a particular type of region. The sequence of areas used here does not attempt to compartmentalize but to form a sequence logically derived from observation of process operation.

Since regions are viewed as the specifically defined dynamic results of process operation, varying in character and extent from area to area although generated by the interaction of identical processes, this course will not utilize one type of region to the exclusion of all other types. Rather, several types will be used simultaneously to make clear to students that empirically many types of regions may be discerned simultaneously in any specified area.

9. Variation in Process Coverage: – The particular regional manifestations of the processes should be considered for each area but the weight (as measured in length of time and extensiveness of homework) given to each process may vary from area to area. In a particular area those processes would be emphasized which are significant for understanding the formation and character of the area's regions or whose concurrent operrations cause conflict between sets of regions (e.g., cultural (language) differentiation vs. national territorial organization in India.) The aim would be to avoid rigid inventory of processes area by area while maintaining conceptual continuity.

10. Variation in Scale of Spatial Units to be Presented: – The scale of generalization used in the course should vary from the global scale through a macro-regional scale to a national scale and eventually to the scale of the individual unit of occupance (establishment/unit of resource utilization). The relationships between these various scales (and these are probably not the only ones possible) should be made explicit. Viewing a particular area from the point of view of the individual establishment as well as from a global point of view should enable the student to relate geographic generalizations to his own condition as well as to make comparisons between his situation and the situation of others in the world. It should also aid in conveying a sense of the reality of culturally different peoples' geographic situations thus avoiding the ever-present "strange places and exotic peoples" pitfall.[11]

IV. Topic Sequences for World Regional Geography Courses of Varying Lengths

Time necessary to present the Course: – This World Regional Geography Course outline is designed primarily as a year course comprising two semesters (or three quarters) or approximately 90 class periods. Less time does not seem desirable (although it might be necessary administratively) because it would prevent treatment of the interacting processes' operation in enough depth to reveal the nature both of their continual operation and of the orderly unfolding of their regional manifestations upon the earth's surface. It is, however, a feasible task for a year course if instruction is conceived creatively and efficiently. Of administrative necessity, however, many World Regional Geography courses are squeezed into less than an academic year, specifically into a quarter (30 class periods) or a semester (45 class periods). The subject matter of this course is conceived so that courses of varying lengths may be developed from it even though the sequence of topics may differ because of the specific length. Alternate sequences have been designed for a two-semester course, a one-semester course and for a one-quarter course. The rationale for each course will be described in the preface to the topic sequence. The systematic process-oriented introductory five weeks is considered basic to sequences of all lengths because it is considered essential to view the globe before viewing its component areas, that is, to examine global processes and their resulting world patterns as a systematic framework for the subsequent examination[12] of individual areas of the world.

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[11] This problem is treated from the point of view of anthropology by both Bennett and Marriott in The Teaching of Anthropology (American Anthropological Association, Memoir 94, 1963). See John W. Bennett, "A Course in Comparative Civilization," p. 197, and McKim Marriott, "An Indian Civilization Course," p. 211.

Bennett says "Perhaps one of the most difficult things of all to achieve in courses dealing with exotic civilizations is a sense of concrete reality. We feel that many courses taught from the area-specialist viewpoint actually contribute to a feeling of unreality, since they stress the exotic and eternal elements in these societies, often presented as maximally different from our own institutions".

[12] It will be immediately noticed that in the topic sequences which follow the subject matter of physical geography is not treated in separate sections. Rather, this material is subsumed under other topics in order to give logical expression to the indivisible character of the geographic approach. It should also be evident, however, that analysis of physical geographic processes is indispensible to the solution of the major problem posed by this course; that is, to show the orderly formation of various regions on the earth's surface because of the migration of human groups possessing particular methods of resource utilization and territorial organization.

The following principles of teaching have been followed in the organization of all the courses:

1. The sequence of subjects should follow a logical development of thought.
2. The treatment of knowledge should be cumulative.
3. The semester break or placement of major tests should come at a logical break in content.
4. The necessary systematic introduction should occupy as little time as possible leaving most of the time for sequential treatment of specific areas.

WORLD REGIONAL GEOGRAPHY:

TWO SEMESTER COURSE: 90 class periods

The organization of the two-semester course's sequence of areal treatment is based on a major phenomenon in world geography, the expansion of certain culture groups to occupy increasing amounts of territory at the expense of other culture groups. Of the great migrations during human history, perhaps most directly related to our understanding of the world's contemporary geographical system is the mammoth European outpouring of the past few centuries.

European migration and contact with other culture groups has caused a major proportion of recent geographical change whether viewed in terms of population movement, the spread of resource utilization systems, expansion of particular forms of territorial organization, or the encirclement of the globe by a market-oriented manufacturing economy expressed in urban settlement and commercial agriculture. Both in number of people involved in migratory movement and in the amount of land successfully occupied, the emigration of Europeans from their homelands is perhaps the greatest demographic movement in history. To find as significant a migration, one would have to turn to the gradual migratory movements by which man first occupied the globe's land surfaces including his original movements into the Western Hemisphere.

From observation of European expansion, several questions may be asked. What characteristics made it possible for one culture group to expel a settled culture group from its habitat and to take over the resources for its own benefit? Have particular culture groups been more successful than others in resisting territorial onslaught? Why has it been the Europeans who expanded irresistably out of their small marginal peninsulas on the Eurasian continent and took over a major proportion of the earth's land surface? How have the particular resource utilization systems developed by the Europeans and their particular forms of political territorial organization aided or limited them in occupying additional territory? For the future, can we predict continued European expansion or can we say that there has been a resurgency of indigenous control over territory not settled by Europeans?

In order to elucidate this theme, the sequence of areas to be treated in the course has been arranged with reference to this major phenomenon. Thus, world land surfaces are divided into two categories: the first category comprises those areas settled by Europeans and their descendents arranged in a sequence according to the size and duration of migration flows from Europe. The United States and Canada, thus, are treated immediately after Europe, then Central and South America, finally Southern Africa, Australia and New Zealand. The second category includes those areas in which indigenous peoples maintained their occupance of territory even while increasing contact with Europeans, be they traders, conquerors, colonial administrators, or would-be settlers, increasingly transformed these areas geographically. The latter areas may be ordered according to the recency of enduring European contact: North Africa and Southwest Asia, South Asia, Southeast Asia, East Asia, Oceania, Africa south of the Sahara.

The arrangement of an areal sequence around this theme seems most appropriate for a two semester course when there is time to examine genetically the chronological development of contemporary geographic patterns.

WORLD REGIONAL GEOGRAPHY: TWO SEMESTER COURSE:
90 class periods

SEMESTER I

I. INTRODUCTION: Global Processes and World Patterns (5 weeks)
  1. Introduction: The Global Geographic System (class period 1)
  2. Regionalization within the system (class periods 2-3)
  3. Homo sapiens: World Distribution and cultural differentiation (class periods 4-6)
  4. Systems of Territorial Organization: A Universal Human Characteristic (class periods 7-9)
  5. Resource Utilization Systems: the Support of Population in the Habitat (class periods 10-11)
  6. Characteristics of the Ever-Changing Habitat (class periods 12-16)

II. GEOGRAPHY OF AREAS OCCUPIED BY EUROPEANS AND THEIR DESCENDANTS (10 weeks)
  1. Europe: A Major Destination of Geographical Innovations Becomes the Principal Exporter Thereof (class periods 17-25)
  2. Destinations of European Migrations: The Americas, Australia, New Zealand, Southern Africa (class periods 26-44)

III. SEMESTER SUMMARY (class period 45)

SEMESTER II

IV. THE GEOGRAPHY OF AREAS OF INDIGENOUS GEOGRAPHICAL DEVELOPMENT (14 weeks)
  1. North Africa, Southwest and Central Asia: the Nomad and Oasis World (class periods 46-54)
  2. South Asia: a Culturally Complex Village Farming Society (class periods 55-63)
  3. Southeast Asia: A Culturally and Ecologically Diverse Frontier Area of Sharp Settlement Contrasts (class periods 64-68)
  4. East Asia: Beyond European Colonial Control (class periods 69-81)
  5. Africa South of the Sahara: The Persistence of Tribal Organization (class periods 82-87)

V. CONCLUSION: Trends of Change in the Contemporary World Geographical Pattern (1 week: class periods 88-90)

WORLD REGIONAL GEOGRAPHY: TWO SEMESTER COURSE

I. INTRODUCTION: GLOBAL PROCESSES AND WORLD PATTERNS

1. Introduction: The Global Geographic System

Geography as the study of man occupying his habitat, the earth's surface, as a unitary global system
- The earth's surface – a single unified space so that one area cannot be isolated from another
  - The outside of a sphere

The contemporary landscape shows the current stage in the long development of human occupance
- Landscape analysis: a method for identifying the processes operating to form geographical patterns
- Regions may be identified within the landscape

The pattern of human occupance as shown by the map of world population density is not random but concentrated in selected areas: the result of the interaction of specific processes
- This course will consider the major processes contributing to the development of geographical world patterns and especially of regions[13] within these patterns
  - Growth and internal differentiation of Homo sapiens
  - Human territorial organization
    - Political
    - Economic
  - Human resource utilization
  - Habitat differentiation
    - Continental
    - Climatic
    - Edaphic

2. Region formation within the system

The region: a central concept of geographical analysis
- In this course, a region will be defined only as an area unified by the occurrence of some measurable spatial phenomenon such as a concentration of points or convergence of lines
- Traditional definitions of the region
- Abstract regional models: powerful tools for perceiving order in heterogeneous landscapes
  - Types: Uniform/formal region
    - Nodal/functional/focal region
  - These types may be defined in two ways:
    - single criterion
    - multiple associated criteria
- Characteristics of regions
  - Regional cores
  - Boundaries and transition zones
  - Arrangement in hierarchies and sets
  - Can be identified for both human and physical phenomena

- The dynamic character of the region
  - Regional formation-functioning-persistence or decay: a process occurring through time

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[13] As perusal of the areal sections will show, most measurable regions are too small to appear in an outline at this scale of generalization.

    - Regions are mobile phenomena
  - Empirical examples of region types
    - Uniform: defined by single criterion
      - defined by multiple criteria
    - Nodal: defined by single criterion
      - defined by multiple criteria
  - Scales of regionalization
    - Uniform regions: the unit area or single phenomenon
      - global sets of uniform regions
    - Nodal regions: the establishment or unit of occupance
      - global hierarchies of nodal regions

3. The world distribution and cultural differentiation of *Homo sapiens*

- Man's accelerating growth to present world population
  - Checks and causes of population growth
    - Malthusian checks
    - Methods of nullifying checks
      - Public health
      - Pacification
      - Prevention of famine
    - Consequent changes in mortality rates
      - Resulting changes in population growth rates
  - Clusters of dense population
    - Demographic characteristics
    - Changing proportional relationships
- Man migrates to occupy the world's land surfaces
  - Long distance migration
    - Major prehistoric migrations into uninhabited areas
    - The nineteenth century European exodus of 60 million people: the greatest migratory movement in history
      - Colonization
      - Colonialization
  - Short distance migration
    - The exodus from rural areas to cities

- Cultural differentiation fragmented the species into smaller groups as increasing numbers of *Homo* dispersed more widely
  - Mutually-recognized cultural uniformity provides basic unity for human groups
    - In this course, *Homo* to be grouped on the basis of culture not "race"
      - Race a mythical not a logical classification
    - Culture defined variously but always concerns the patterning of men's ways of life
      - Learned by intra-group and inter-group communication
      - Major manifestations of culture universal to all human groups
        - Value systems
        - Kinship and interpersonal relationship patterns
        - Resource utilization systems
        - Territoriality
        - Language
      - Continuously changing: a universal process
        - Innovation
        - Diffusion
        - Acculturation

- Groups use culture for self-identification as well as for differentiating others
- Linguistic uniformity a prime basis for culture groupings
  - Language: human invention for symbolic communication prerequisite for interpersonal learning
    definition and characteristics
  - The process of language differentiation
    - Evolutionary
    - Genetic classification of languages
  - Linguistic history the key to migration patterns
  - World pattern of language families

4. Systems of Territorial Organization: A universal human characteristic

- Political territorial organization: to maintain peace and law necessary for resource allocation preliminary to exploitation
  - Nation-state system: now globally accepted with respect to land surfaces: concept of national sovereignty
    - Based on mutually exclusively defined areas
    - The oceans: a troubling loophole
  - Superseded but still persisting systems claiming allegiances of people
    - Based on defined populations rather than defined areas
    - Surviving remnants:
      - Feudal and dynastic kingdoms
      - Tribal groupings
      - Ecological dominants
  - Resource tenure systems regulate the social availability of resources
    - Function within the legal framework of political territorial organization
    - Individual and/or communal proprietorship
    - Many variant systems possible

- The territorial organization of settlement
  - The spatial arrangement of units of occupance
    - Dispersed: characteristic of rural areas
    - Clustered: the origin of settlements
    - Clusters of varying size and functions
      - Hamlets, villages, towns, cities, conurbations, megalopolis
    - Support of settlements
      - Existence based on export function
        - "Central places": social, political, economic
        - Manufacturing and mining
        - Trade and transportation
      - Made possible by occupational specialization
      - Market areas and hinterlands

    - Growth of settlement networks
      - Central place theory and gravity model
      - Central places and their tributary areas as nodal regions
      - Hierarchical patterning in function, size, spacing
      - Linkages between settlements

5. Resource Utilization systems: the support of population in the habitat

- Global distribution of resource utilization types and systems
- Classification of resource utilization systems
  - Unit of occupance/establishment: the basic unit of resource utilization
    - Types of production
      - Resource perceived and used
      - Media of production:
        - Plants and animals
        - Machines and chemicals
        - The concept of technological level
      - Level of production as measured by different variables
        - Per land unit
        - Per labor input
        - Per total input
    - Organization
      - Product mix
      - Internal organization of production
      - External liknages of producing unit
        - Sources of input supply
        - Markets
    - Destination of production
      - Motivation for production
  - Traditional typology of resource utilization
    - Hunting and gathering
    - Agriculture and animal husbandry
      - Marine and forest harvesting
    - Mining and manufacturing

- History of resource utilization development
  - Pre-agricultural occupance
  - "Neolithic Revolution"
  - "Industrial Revolution"
  - Persistence of "obsolete" types of resource utilization
    - Process of resource use change
- Organization into national economies and other types of systems
  - Classification of types of systems
    - Bobek's and Wagner's classifications
  - The integration of national economies
    - Economic bases and resource endowments
    - Occupational specialization of the population
    - Dual and plural economies
    - The role of infrastructure: power supply and transportation
  - National development of the economy
    - GNP as a measure of national economic development
    - "Economic development": the shift from an agrarian-based to an industrially-based economy
      - The problem of raising the standard of living
      - Types of resource endowment
    - Governmental planning for economic development
    - National economies characterized
- Influence of resource utilization systems on perception and settlement of habitats
  - Estimating habitat parameters

6. Characteristics of the Ever-Changing Habitat

- Man's natural habitat is continuously changing although the rate of change is only rarely perceptible to man
- Man lives at the interface between the global surface and the atmosphere
  - The single global surface is perceived as essentially dual in nature whether seen as inhabitable space, territory, or source of resources
    - *Homo* as a species has witnessed a relatively small amount of landform change
      - Present distribution of land and ocean: product of long interplay of tectonic forces
      - Crust of varying thickness and stability: a single system with zones of weakness
        - Highest and lowest points: Himalayas and Philippine Trench
        - Wegener theory of Continental Drift
          - Land water hemispheres
    - Continental platforms
      - Pre-Cambrian old rock platforms
      - Young mountain chains of volcanic origin and recent building
        - "Pacific Ring of Fire"
        - Global zones of weaknesses including rift valleys and Mid-Atlantic fift
      - World pattern of great river basins, internal drainage basins, limited areas of local river basins
        - River basins as nodal regions
          - Importance to human occupance of alluvial flood plains of great river basins
        - Erosion: the formative process by action of atmosphere
          - Glaciation sculpts localized landforms
    - Ocean fills depressions in wrinkled global crust
      - Continental runoff
      - Landforms
      - Source of water vapor for atmosphere

  - Climate as the localized internal differentiations of the atmospheric envelope
    - Atmospheric circulation: the global system's characteristics
      - Influence of unequal heating of global surface, radiation and temperature inequalities
        - Air circulation: masses and currents
      - Influence of the land distribution pattern
        - Effects of unequal absorption and reradiation rates
      - Cyclic character of temperature and pressure variations

    - Water in the atmosphere: the hydrologic cycle
      - Sources of water vapor
      - The movement of moisture by air currents
      - Precipitation: types and causes
        - spatial distribution
        - temporal variability
    - The water balance: precipitation crosses the interface
      - Definitions of aridity and humidity
    - The seasonal cycle

    - The problem of discerning uniform regions in the natural environment
      - Can a continuum of changing climatic conditions be regionalized?
        - Vegetation types: a principal surrogate
          - An ecological abstraction
          - Plant responses to climatic conditions
        - Soil types: a secondary surrogate
          - Soil forms the land/atmosphere interface
    - The poleward progression of climate types
      - Orderly variation of: level and range of temperature
        - level and range of precipitation
        - seasonal cycle
      - Orderliness distorted by pattern of land and ocean distribution
        - Altitudinal progression of climatic types
- Man's perception of his habitat
  - Basic to settlement and migration patterns of various culture groups
    - World views of Europeans contrasted with others

TEST PERIOD

II. GEOGRAPHY OF AREAS OCCUPIED BY EUROPEANS AND THEIR DESCENDANTS

1. Europe: a major destination of geographical innovations becomes the principal exporter thereof

- The contemporary position of Europe in the world: a summary of current occupance
  - The northwestern fragmented peninsular fringe of Eurasia
  - Culture hearth for expansion of language/culture groups
  - Innovation site for political territorial organization: EEC
  - The productive core of a nodally organized industrial region
    - Leader in world producers' goods production
  - World's most intensive urban settlement
  - Present landscape: a densely-populated urban industrial network enclosing governmentally-sustained farms and relict or planted forests
    - Unit of occupance examples from N.W. Europe, Mediterranean Europe and the Soviet Union

- Northwestern Europe: exporter of population, power, technology, and ideas: political and economic organizer of the world, once an early destination for migration and cultural diffusion as a marginal area to the Mediterranean Empires
  - European culture groups become stabilized in space
    - Sparsely populated and impermanent settlement until past few hundred years
    - Tribal migrations into a periglacial environment
    - Establishment of language groups' distribution
      - Successive migrations' effects
        - Dominance of Indo-European language family
        - Intrusion of other linguistic groups

- Effects of acculturation and Roman conquest
- Continuous political territorial innovation transcends the nation-state
  - Innovation of nation-state transforms basis of territorial organization
    - Supercedes feudal monarchies
    - Fixed territories nodally organized around culture groups' areas
  - Solidification of the nation-state: refinement of the system
    - Colonization and colonialism: the nation-state embraces the globe
  - After the nation-state: the collapse of colonialism; the European Economic Community

- European replacement of agriculture as the base of national economies by the innovation of manufacturing permanently transforms the landscape
  - The development of urban-oriented intensive animal husbandry and mixed agriculture
    - Large mammal hunting in periglacial Europe is replaced by small grain and herd animal agriculture
      - Diffusion from the Fertile Crescent
      - The European environment
        - Climatic types and conditions
        - Soils and vegetation
    - Development of feudal village settlement based on small grain agriculture
    - Transformation of agricultural resource use
      - Open-field village based on small grains gives way to animal husbandry ("mixed") farming and specialized crops
      - Governmental sponsorship of change
      - Introduction and adoption of American and Asian crops
      - Dissemination of scientific farming
  - The urban orientation of contemporary farming
    - High-value production for urban market demand
    - Government support of specialized farming
    - Reliance on overseas areas for foods

- The innovation of intensive industrialization
- Precursors of industrialization
  - Exports to the Classical World: tin, amber, furs
    - Colonial conquest and exploitation of minerals
  - Medieval rise of towns based on trade
    - Europe becomes a market
    - Handicraft manufacturing develops
    - Trade routes and traffic
      - Landforms as barriers and channels
  - Industrial revolution - energy revolution
    - Technological innovations aided by capital investment begin the rise of industry
      - Increased scale of production
        - Powered by fossil fuel resources
    - Firm, factory and mine: industrial units of occupance

Transportation linkages intensified: the development of high-speed bulk carriers
Banking, brokerage and commerce grow to provide services for industry

NW Europe as a primary nodal region of industrial production today
Producers' goods emphasized
Urbanization based on manufacturing, mining and transport replaces rural settlement
Industrial cities replace towns based on trade and political power
The alluring city: focus of flight from the countryside
Central places and connurbations dominate the landscape

Diffusion of geographical innovations to the rest of Christian europe
The lag of Mediterranean Europe, similar in culture but slow to change
Roman territorial organization and its disintegration
Muslim occupation of the Mediterranean's southern shore
Development of feudal and monarchical kingdoms
Late consolidation of the nation-state
Persistence of village small-grain farming
The Mediterranean environment
Olive, grape, citrus: specialized adapted crops
Recent adoption of governmentally-induced changes
Industrialization, tourism raise national productivity

The eastern frontier of Europe: Russia becomes the Soviet Union
Slavic exporter of European innovations
Location on Europe's empty inland fringe confronting Asian culture groups
The western wedge of settlement versus the Siberian forest wilds
Culturally and economically a part of Europe
Expansion of the Slavs
Domination of peripheral non-Indo-European culture groups
Political territorial organization of an expending nation-state
Siberian expansion into sparsely occupied territory
Consolidation of the national territory
Incorporation of central Asian densely settled areas
Political organization of minorities in the Soviet Union

State control of the economy forces rapid expansion of resource utilization to build an industrial economy
The Soviet seizure and consolidation of power over economic production
State control of the resource base
National planning as the tool for economic change
The goal: international power by means of the forced shift of the economy and the labor force into industry
Collectivism transforms village agriculture

            - The expansion and persistence of feudally organized village agriculture at the taiga's southern edge
        - Russia's agricultural environment
            - Cold and drought: the continental enemies of Russian farming
        - Futile feudal attempts at modernization
            - Collectivization: the rationalization of agricultural production on the factory model
            - Persistent problems of production levels
    - Planned industrialization and urbanization of the USSR
        - Innovation of the Five Year Plan
                - State investment primarily in heavy industry and mining
            - Building a transport and communications infrastructure
        - Successful development of a world-leading industrial economy
            - Consequent urbanization
    - The Soviet Union as an exporter of geographical innovations
        - Soviet diffusion of Communist forms of political territorial organization and resource utilization
        - Effect on Eastern Europe: the reorganization of national economies and resource utilization systems
        - Attempts at reorganization of political territorial organization and resource utilization outside Europe: e.g., Cuba, Mongolian Republic, China
- The expansion of the Europeans outside Europe
    - Emigration and colonization: the dispersion of surplus population automatically spreads European culture
    - Colonialization forces diffusion of European ideas through political control.

2. Destinations of European Migrations

- The Americas: the principal destination of European emigration although fully settled by the descendants of migrants from Asia
    - The Pre-Columbian landscape: widely varying cultural groups with differing population densities, resource utilization systems and territorial organization
    - Population distribution and cultural differentiation resulting from successive migrations, innovation and adoption of various resource use systems
        - Original movements into the Americas by hunters and gatherers
            - The land surface they gradually discovered
        - Linguistic distributions reveal patterns of migration
    - Bands, tribes, and kingdoms organized and controlled territory and allocated resources among groups

- Population densities and permanency of settlement varied with diverse resource utilization systems
    - Diversification of hunting and gathering systems in a diverse habitat

- Conditions of the habitat
    - Climate types
    - Biotic resources: vegetation and animals

- The innovation of American agriculture
    - Staple crops and cropping systems
        - Tropical American culture hearths

    - Support of densely populated kingdoms
        - Development of an urban settlement pattern
    - Diffusion of agriculture throughout the Americas
        - The partial replacement of hunting and gathering

1492: End of an era of undisturbed occupance

- The initial conquests focused on the densely settled inter-Tropical areas
- The near extinction of aboriginal populations throughout the Americas
    - Strongest survivals in the regions of dense settlement
- The transfer of the Americas' entire land surface to European control

TEST PERIOD

United States and Canada: the flowering of European innovations in resource utilization and territorial organization in a habitat perceived as a richly-endowed tabula rasa

- The contemporary landscape: densely populated urban industrial networks dispersed within commercially specialized farms, mines, and forests interlaced with abandoned lands
    - Forms patterning the landscape primarily European-derived
- Replacing the original population
    - European, African and other migration

- Organizing the territory for settlement and resource utilization
    - The allocation of North America between Canada, the United States, and Mexico

    - Internal political territorial organization of the United States
        - Conquest and cession obliterate Indian occupance
            - Attempts at cultural extinction of the Indians
            - Contemporary remnants and their futures
            - Imposition of a land tenure and resource allocation system to obtain dispersed farm settlement

- Building an industrial economy of high productivity supported by commericialized farming, mechanized mining and lumbering: the exploitation of a rich resource base
    - Importation and modernization of European mixed farming
        - Evolution and transformation of the American family farm
        - Innovation of new farm types, e.g., ranching
        - Government support of large-scale specialized farming
            - Abandonment of marginal land and farms
                - Leaving the land for cities

- Development of an urban United States
  - Rise of industry and consequent urbanization
    - Development of the corporate firm
      - Mining rich resources
    - Spanning the continent with transport links

    - Support, supply and stability of urban networks
      - Cultural diversity versus standardization

- Canada - the politically-truncated American northern fringe
  - Immigration parallels
  - Political territorial organization within the Commonwealth
  - Parallel development of resource utilization units
    - Functional domination by U.S. corporations
    - Unity of urban hierarchies

- Iberian America
  - Contemporary landscape: cities and subsistence survivals, fragmentary organization of territory both political and economic

  - Immigration and evolution of presently occupying culture groups
    - Population distribution and growth
    - Persistence of densely settled Indian populations

  - Political organization of territory
    - Colonial Empires: Spanish and Portuguese, other
    - Post-Colonial fragmentation into nation-states
      - Problems of nation-state consolidation
      - Attempts at wider unity

  - Utilization of territory
    - Mining exploitation
    - Types of agricultural resource utilization
      - Persistence of Indian occupance
      - Spread of European agricultural systems
      - Frontiers of settlement
      - Population pressures
      - Contemporary problems of resource development

    - Development of urban hierarchies
      - Orientation toward Europe

- Outliers of European settlement
  - Australia and New Zealand
    - Contemporary landscape: urbanized, commercialized, Atlantic-oriented

- Immigration and evolution of present culture groups
- Extinction of cultural assimilation of aboriginal inhabitants
- Political territorial organization within the Commonwealth
  - Recently increasing Asian orientation
- Establishment of urbanized industrialized resource utilization based on commercial expert agriculture
  - Economic organization of an emptied land
  - Economic exploitation of British ties

Southern Africa

- Contemporary landscape: Northern European settlers' response to persistent occupation of territory by aboriginal occupants
  - Taking over and establishing exploitation of the land
    - Development of a dual tenure system
  - Problems of political territorial organization: internal and external
    - The British Protectorates
- Urbanized industrialized resource utilization based on commercial agriculture
  - Problems of Apartheid

Failures: Kenya, Algeria

- Small amount of immigration in proportion to indigenous inhabitants
- Fragmentary political control of territory
- Short time-depth of settlement of resource utilization

III. SEMESTER SUMMARY

1. Settlement foci for European expansion: those sparsely settled habitats in which European mixed-farming could be successfully established
   - Sparsely inhabited: land take-over possible
   - Health conditions permitted Europeans and their animals to survive
   - Mixed farming adapted from the woodland to the grassland made possible European expansion of settlement into semi-arid habitats
2. Cultural, political, economic ties mutually reinforce the development of urban-oriented industrialized resource utilization systems within stably-governed nation states having dominant cultural standards derived from Europe
   - Problems created for other parts of the world

SEMESTER EXAMINATION

SECOND SEMESTER

IV. THE GEOGRAPHY OF AREAS OF INDIGENOUS GEOGRAPHICAL DEVELOPMENT

1. North Africa, Southwest and Central Asia: the Nomad and Oasis World
   - Contemporary position in world and landscape: significant regions and representative units of occupance
     - Oasis small-grain irrigation gardening and rainfall farming; nomad tents in denuded forests, cities as centers of trade and religion, seats of power
   - Migration of present cultural groups throughout the area
     - Arab expansion; Turkic expansion; Mongol expansion
       - Extinction of prior systems of occupance
       - Religion and language used as cultural identifiers
         - Persistence of minorities

   - Dynastic and Imperial territorial organization of these areas
     - Continual conflict with Christian Europe
     - Caravan trade - linkages between city networks superimposed on village settled areas
     - The persistence of the Ottoman Empire

   - Resource Utilization: intensive use of an arid landscape
     - The intensification of small-grain agriculture through irrigation
       - The great river valley areas of dense settlement

     - The symbiosis between village and tent

     - Nomad pastoralism: specialization in annual production
       - The pastoral usefulness of forests
   - Geographical effects of European contact and colonialization

     - Political territorial reorganization: European imposition of the nation-state
       - Strategic importance athwart the British Empire's transport route
       - The export of European culture: commercialism, nationalism

     - Exploitation of resources: mining for oil: the introduction of the foreign corporation
       - Efforts at "economic development"

   - Resurgence of indigenous control of territorial organization and resource utilization
     - Adoption and implementation of nation-state organization
       - Growth of primate cities
     - Adoption of an industrially based economy as a goal
       - Planned economic development and problems of population growth

2. South Asia: a culturally complex village farming society

   - Contemporary landscape: significant regions and representative units of occupance
     - Crowded villages on arable land
     - Great coastal cities increasingly industrialized

- Successive migrations: the foundation for cultural complexity
  - Migration history as indicated by linguistic distribution
  - Language and religion as cultural unifiers
    - Caste stratification reinforces occupational specialization

- The territorial organization of city-states based on village hierarchies
  - The structure of village settlement
    - Land tenure and landlords
  - Development of princely states and empires

- Resource Utilization: specialized grain staple farming to produce the maximum despite environmental constraints
  - The drought-ridden habitat
  - The village farming system: grain production aided by cattle as auxiliary producers of labour, milk, fuel, and leather
    - Wheat, millet, rice, and pulses: the great staple crops
  - Other habitat utilizations

- Geographical effects of European contact and colonialization
  - Political unification of the sub-continent
  - An urban hierarchy developed for administrative needs based on the growth of commercial and transport facilities

  - The commercialization of agriculture: plantations and cash cropping develop a dualistic economy
    - Agricultural resource development
  - Beginning of industrialization
  - Growth of population

- Resurgence of indigenous control of territorial organization and resource utilization
  - Conflict between the culture grouping of society and implementation of the nation-state idea

  - Adoption of economic planning toward an industrially based society

TEST PERIOD

3. Southeast Asia: a culturally and ecologically diverse frontier area of sharp settlement contrasts
   - Contemporary landscape: significant regions and representative units of occupance
     - Densely settled rice-growing lowlands separated by highland forests
     - Primate city ports: the foci of national, political, and economic organization
   - Successive migrations exploit mainland and archipelagos
     - Linguistic and cultural diversity

- Expansion of Malayo-Polynesians both West and East
  - Why was Australia shunned, New Zealand only lightly settled?
- Chinese, Arab, Indian contacts

Types of territorial organization varied with settlement systems
- Princely kingdoms; tribal federations

Resource utilization systems the basis of settlement concentration
- Irrigated and flooded rice in alluvial plains

- Shifting rainfall cultivation in forested highlands
  - Incursions of terraced and irrigated gardening
- Pacific gardening of tuber staples

Geographical effects of European contact and colonialization
- Establishment of rival colonial empires by Spain, Portugal, Netherlands, France, Britain, U.S.A., Australia
  - Growth of urban networks for administration and commercial exploitation
  - Commercialization of production for metropolitan needs
    - Plantation agriculture and cash cropping
    - Mineral exploitation
    - Dualizing economies - importation of necessary labour

Resurgence of indigenous control of territorial organization and resource utilization
- Indonesian and others' problems of political organization and resource utilization planning

4. East Asia: beyond European colonial control

A. China: the habitat longest occupied by a culture group in contemporary control
  - Contemporary landscape: significant regions and representative units of occupance
    - Recently isolated village settlements increasingly incorporated into political and economic nation
    - National territorial organization focused upon growing industrial cities

  - Establishment and expansion of the Chinese from the Wei valley
    - Southward expansion of the northern Chinese
    - Cultural absorption of non-Chinese
    - Stabilization of cultural identity

  - Development of imperial political and economic territorial organization
    - Hierarchy of market towns and administrative capitals
      - Development of linkages by road system and canal

  - Degree of persistence of hierarchy throughout
  - Dynastic changes and nomadic pressures

Resource utilization: intensively developed agriculture based on eastern riverine lowlands
  - At least two agricultural systems both based on labor - intensive gardening
    - Non-irrigated wheat farming system in northern habitat

    - Irrigated rice farming system south of growing season limits
  - Support of intensive village settlement networks

  - Utilization of non-cultivable areas
  - Mineral exploitation

Geographical effects of European contacts:
  - Establishment of new crops: maize, sweet potatoes
  - Resistance to European linkages despite increasing export production of commodities: tea, silk, tung

  - Century-long interregnum means continual disruption of internal peace and production
    - Increasing foreign penetration - economic and military
  - Consolidation of power by Chinese Communists restores internal peace
    - Communist reorganization of resource utilization

TEST PERIOD

B. Japan: urban industrialism successfully attained by selective acculturation

Contemporary landscape: significant regions and representative units of occupance
  - Urban industrialism, intensive irrigated rice farming, and utilization of marine resources

Migration of presently occupying culture groups in Northeast Asia
  - Displacement of the Ainu
  - Establishment of Japanese settlement hearth around inland sea
    - Cultural influence of China

Territorial organization of the archipelago

Resource utilization systems: intensive development of available resources
  - Intensive irrigated rice gardening pushed northward
  - Sea-farming extends control of resources into coastal waters
  - Forests and water intensively utilized

Japanese response to European contacts: transformation of resource use during 19th century

- Scientific improvement of agriculture
- Government sponsorship of industrialization to attain military power
- Bureaucratic unification of political territorial organization
  - Japan's experience at colonial political expansion
- Consolidation of urban industrial economy
- Japan's present position as the single Asian industrial economy

5. Africa South of the Sahara: the persistence of tribal organization

Contemporary landscape: significant regions and representative units of occupance
  - Agriculturally-based tribal settlements only fragmentarily incorporated in commercial urban hierarchies and nation-states

Migrations and expansions of linguistic and tribally-organized groups into habitats receptive for specialized agricultural and animal husbandry systems
  - Implications for migration history of Greenberg's linguistic analysis

Types of territorial organization
  - Feudal kingdoms
  - Tribal hierarchies and autonomous settlement networks
  - Ecologically-dominant groups

Resource utilization systems: often specialized to linguistic or tribal groups, localized in appropriate habitat

- Bush fallow agriculture: millet, sorghum, yam, banana based
  - Asian crop introductions
- Intensive urban farming of West Africa
- Cattle-keeping farmers
- Herding culture groups with auxiliary agriculture
- Remnant hunters and gatherers

Geographical effects of European contact and colonialization
  - Internal disorganization of tribal occupance systems by slaving
  - Acceptance of cassava, maize, other American crops envigorated bush fallow farming
  - Colonial political territorial partitioning and subsequent reorganization of area

    - "Freezing" of culture groups' occupation of territory
    - Immigration: European and Asian
  - Commercialization of resource utilization
    - Establishment of plantations and mining ventures
    - Cash cropping introduced into bush fallow farming
  - European colonization attempted widely
    - Southern Africa - a permanent success?

- Resurgence of indigenous control over political territorial organization and resource utilization
  - Problems of perpetuating nation-state bureaucratic organization in face of rival tribal territorial systems
    - Definition of non-Africans' role
  - Maintenance of commercialized resource utilization based on foreign markets

V. CONCLUSION: TRENDS OF CHANGE IN THE CONTEMPORARY WORLD GEOGRAPHICAL SYSTEM

1. Culture Groupings' Occupance of Territory

- Cessation of large scale international migration
- Incorporation of diverse culture groups into national cultural standards
- Gradual economic assimilation or relict groups; e.g., Eskimos
- Persistence of sub-national groupings with cultural identity

2. Systems of territorial organization

- Global dominance of nation-state system of territorial organization
  - International partitioning of world between power blocs
    - Attempts at supra-national organization for specialized purposes
  - Internal structuring of the nation-state - the paramount task for many
- Further expansion of hierarchial urban settlement networks with concomitant rural emigration and abandonment of marginal agricultural land where possible

3. Resource utilization systems

- Global diffusion of industrialized use of natural resources and consequent urbanization of human resources
  - Development of several nodal industrial regions supplying world markets
  - Success dependent on agricultural transformation
- Planning of resource utilization by national governments increasing
  - Governmental attempts to control population growth more active
    - Problem of resource depletion and habitat pollution severe
- International problems of matching markets and production, investment destination and development needs
- International pressures to lessen global range of productivity levels

4. The responsibility of the United States in the changing world geographical system

FINAL EXAMINATION

WORLD REGIONAL GEOGRAPHY:
ONE SEMESTER COURSE: 45 class periods

By following the time schedule outlined below, the general theme of the two-semester course can probably be explored in one semester. In such a truncated course, more emphasis would have to be placed on contemporary conditions than upon genetic rationale even though it is the latter which forms the basis for prediction. In cutting the time length for examination of particular areas down to size, the sections on territorial organization and resource utilization systems should be given priority over full treatment of culture group migration and settlement. Treatment of present landscape characteristics could probably be subsumed under the high priority topics.

Under this scheme, the time periods for the topic sequence could be collapsed in the following manner;

I. Introduction: World Processes and Global Patterns		5 weeks
II. Geography of Areas Occupied by Europeans and their Descendants		4 weeks
1. Europe	(2 weeks)	
2. Destinations of European Migration		
United States and Canada	(1 week)	
Iberian America	(1 week)	
III. Geography of Areas of Indigenous Geographical Development		6 weeks
1. North Africa, Southwest and Central Asia	(1 week)	
2. South Asia	(1 1/2 weeks)	
3. Southeast Asia and Oceania	(1 week)	
4. East Asia	(1 1/2 weeks)	
5. Africa South of the Sahara	(1 week)	

WORLD REGIONAL GEOGRAPHY:
ONE QUARTER COURSE: 33 class periods

One quarter is too short a time period to attempt a world regional course considering the basic theme of the two semester course here presented. Portions of the subject matter of that course, however, might be rearranged in a course designed to consider the inequality inherent in the distribution pattern of Homo sapiens over the earth's land surface, a provocative geographical problem in itself. Thus, the theme of the one quarter course might be the successful settlement of particular habitats by man through history as measured by the continued support of dense populations.

After full treatment of the Introductory "World Processes and Global Patterns" (which in this particular course's time span would become a major portion of the course), those areas would be treated which have been most successfully exploited by man for dense and stable settlement and intensive resource utilization. The sequence would be arranged by relative length of time during which dense populations had been successfully maintained. To pursue this theme most efficiently, the introductory presentation of systematic processes could be oriented to global consideration of the problem.

Using this theme, the time periods and topic sequences would be as follows:

I. Introduction: World Processes and Global Patterns (5 weeks)

II. Areas of Dense Settlement (4 weeks)
  1. China and peripheral outliers
  2. The Indian Sub-continent
  3. Europe and northeastern North America

III. Points and Lines of Dense Settlement (1 week)
  1. Locations founded on intensive agriculture
  2. Locations founded on commercial production, industry, and subsequent urbanization

IV. Areas not Densely Settled (1 week)

V. Consideration of Teaching Strategies Appropriate to These Courses

To implement the conceptual aims of this course, a particular teaching strategy has been chosen from several alternatives. The particular methods of presentation and types of materials discussed below seem to be those most suitable for stimulating a student's interest and luring him to develop heightened awareness of (and further curiosity about) the vast variation of the earth's surface.

Type of Presentation: - The course's material would be covered by lecture, discussion, or exercise (work sessions), using each where appropriate. Continuity should be provided by the class sequence not by a textbook. Lectures are to be designed as presentations for which a textbook could not be substituted. They should each ideally be a vivid 50-minute sequence of visual and audial perceptions by which the student would experience the elegant exposition of particular concepts illustrated by supporting facts. Student reading and exercise assignments should enlarge and enrich the fundamental thematic structure of the course as presented in class.

Types of Materials: - All types of materials should be considered for possible use in this course, not merely textbooks. A primary pedagogic aim should be to acquaint the student with the great variety of sources which can inform him about the world's geography, therefore a single uniformly presented and organized source such as a comprehensive textbook (no matter how skillfully done) seems inappropriate although perhaps administratively necessary in some situations.

When introducing the student to such varied sources of information, it is necessary to make explicit the relationship between particular materials, especially if on a specialized topic, and the concepts presented in lecture by referring to the reading, film, or other material, and interpreting it at the appropriate point in the presentation. I think the most stimulating course would be taught by using a mixture of source materials both in and out of class: article reprints, paperbacks, monographs, reference volumes, fiction, programmed learning units, maps, slides, films, perhaps even recordings.

Visual materials certainly deserve a more prominent place both in and out of class, not as "aids" but as primary sources of geographic information. The continual use of an atlas, especially of its specialized world distribution maps, both in and out of class, is basic to the presentation of the course. By referring directly to graphically represented map patterns, much verbal description can be omitted. Direct comparisons may be made between map patterns or a map pattern related to photographs of the phenomenon mapped if two slides or transparencies are projected simultaneously. Various types of materials should be utilized, however, only when relevant to carrying out the conceptual aims of the course. I expect that it might be possible to cover certain topics in reading and unsupervised exercise (programmed instruction) and not in class (e.g., earth-sun relationships).

Teaching strategy and course conceptualization and content are here considered basically inseparable. Success in presenting an ambitiously complex amount of geographical material depends directly upon the teaching methods employed. Conversely, elaborate and technically polished presentation of intellectually arid material perhaps is the pop art version of teaching. This course design's aim is the presentation of significant geographical material by provocative teaching strategies to fascinate and involve the student not to bore him into apathy.

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VII. Other Approaches Available in Textbook Form

This essay outlines a particular conceptual framework for teaching World Regional Geography. There are, however, other approaches most articulately presented in current textbooks.[15] Generally, these textbooks seem to be organized in one of three different ways: using cultural regions (often the nation-state) as the organizing category, using physical (usually climatic) regions as the framework, or developing a theory of regional development as a theme and surveying the world from that point of view. Most texts utilize regions primarily as mutually exclusive areal compartments into which to divide the earth's surface.

The world regional geography textbooks published in the last decade and currently in print are listed below by recency of publication:

1966 James, Preston E. with the collaboration of Hibbard V.B. Kline Jr. A Geography of Man. 3rd ed. New York: Blaisdell Publishing Co., 1966.

Murphey, Rhoads. An Introduction to Geography. 2nd ed. Chicago: Rand McNally, 1966.

1965 Griffin, P.F., and Chatham, R.L. Introductory College Geography. San Francisco: Fearon Publishers, 1965.

Morris, John W., and Freeman, Otis W. (eds.). World Geography. 2nd ed. New York: McGraw-Hill, Inc., 1965.

1964 Carter, George F. Man and the Land. A Cultural Geography. New York: Holt, Rinehart, and Winston, Inc., 1965.

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1963 Heintzelman, Oliver H., and Highsmith, Richard M. Jr. World Regional Geography. 2nd ed. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1963.

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1962 Hoyt, Joseph Bixby. Man and the Earth. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1962.

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[15] For a useful compilation of textbooks, see John V. Bergen, Introductory College Geography Textbooks, 1940-1965: A Bibliographic Summary, National Council for Geographic Education: Special Publication No. 9, 1966.

1961 Russell, Richard J., Kniffen, F.B., and Pruitt, E.L. Culture Worlds. Revised ed. New York: Macmillan Co., 1961.

Wheeler, Jesse H. Jr., Kostbade, J. Trenton, and Thoman, Richard S. Regional Geography of the World. 2nd ed. New York: Holt, Rinehart, and Winston, Inc., 1961.

In order to indicate the variety of approaches that may be used to present world regional geography, a precis of each textbook is presented below. For each volume, format, author's aims, chapter titles, and other relevant information are stated in a uniform style so that the texts may readily be compared. The selected passages are direct quotations from the pages indicated. The textbook precis are arranged alphabetically by author.

Carter, George F. Man and the Land: A Cultural Geography. (New York: Holt, Rinehart and Winston, 1964).

xiv + 496 pp.; 69 world and specialized maps; many photographs and diagrams; bibliography; index.

"Too often texts become attempts to supply the vast factual background of a subject rather than to develop the reader's ability to deal with a particular class of data. ... When, however, principles and processes are isolated and shown at work in real situations, they serve as the key to understanding the dynamic nature of the existing scene.

The difficulty is that the role of principles and processes tends to be obscured by the numerous interactions between man and the land, for the varied races of man with differing cultural-historical backgrounds distributed over a diversified physical earth create a most complex problem. The method used here is to reduce this complexity so that the various factors may be seen clearly at work. This makes it necessary to study one factor at a time, observing what happens when it varies while the other factors are held constant. Since man, land, and culture are the principal factors in human geography, they are studied as constants and as variables.

Race is genetic. Our bodily differences can be shown to be the result of standard biological processes ... The presentation shows the value of systematic treatment with an emphasis on process. ... the same method of examination is extended to an analysis of mental differences among the races. This examination demonstrates the improbability of the existence among the races of mental differences of like degree to the physiological differences. The analysis goes far toward removing mental differences among the races as a causative factor in the differentiation of the earth as occupied by man ...

Similarly, causative factors in the differentiation of the earth are isolated by imagining a uniform earth peopled by a uniform race. It is then seen that without differences in race or physical environment man may still be expected to develop differing ways of life and, reacting on the physical environment, change the formerly uniform physical environment to a varied one. ...

With the factor of race approximately eliminated ... and the physical environment reduced in importance though not eliminated, the problem becomes one of reducing the factor of environment still further so that the role of the cultural-historical processes can be seen more clearly.

This is done by comparing regions of similar climatic type around the world. ... Since the climates are similar and all aspects of the physical environment, such as vegetation and soils, are likewise similar to some degree, the major variations must be due to the other factors. With the factor of race previously virtually eliminated, the cultural-historical processes emerge with clarity. This approach by means of analyzing processes is prevented from becoming abstract theorizing because investigation proceeds by means of actual case studies.

With such an approach it is not necessary to treat equally all countries, all parts of the world, or all of time. Accordingly, the extent of treatment ... varies throughout the text. Interest is ... in observing processes at work. For this purpose one area is best for exemplifying sequent occupance, another the effects of isolation, ...

The book aims primarily to develop a way of thinking about man's relation to the land, and it is principle and process oriented. Although the main objective is to develop an understanding of how the present situation came about, sufficient earth description is included to give an overall view of the actual earth and the men on it. The book is based on the conviction that an understanding of relatively few underlying principles and processes will enable the student to find meaning in the wide diversity of the earth about him.

... It is hoped that the student will gain from the book the ability to judge correctly in the weighting of race, physical environment, and cultural-historical factors in the development of the humanly occupied earth as we now see it, and thus be better able to judge the probable direction and rate of change in differing areas with differing peoples and differing cultures. (pp. v-vii)

11 chapters and Introduction

1. The Origin of Man
    - Adaption, Physiology, Climatic Impacts
    - Hypothetical Man on an Unreal Earth
2. Arid Lands
    - Old World Dry Lands: Egypt and the Near East
    - Culture and Environment in the American Southwest
    - South America
    - Africa and Australia
3. The Wet Tropics
    - Culture and Civilization in the Tropics
    - The New World Tropics
    - The Old World Tropics
4. The Mediterranean Climate
    - The Mediterranean of the Old World
    - The New World Mediterranean Climates
    - South Africa and Australia
5. East Coast Mid-Latitude Forest Lands
6. West Coast Mid-Latitude Forest Lands
    - Northwest Europe
    - The Americas
    - Lands in the Southwest Pacific
7. The Grasslands
    - Man in the Grasslands of the United States
    - The Argentine and Australian Grasslands
    - Pastoral Nomadism: Eurasia and Africa
8. Mountain Lands
    - Mountain Lands in the Tropics: Africa and Asia
    - New World Tropical Mountain Lands
    - Mid-Latitude Mountain Lands
    - High-Latitude Mountain Lands
9. The Northern Forest Lands
    - Man in the Northern Forest Lands
    - Modern Use of Northern Forest Lands
10. The Polar Lands
    - The Eskimos
    - Antarctica: Uninhabited or Uninhabitable?
11. The Role of Physical Environment and Culture

Griffin, Paul F. and Ronald L. Chatham. Introductory College Geography. (San Francisco: Fearon Publishers, 1965)

xiv + 402 pp.; 429 figures: world and specialized maps, diagrams, and photographs; 8 world and continental maps; 2 tables; selected references at the end of each chapter; study exercises; glossary; index.

"Introductory College Geography is a world regional geography designed to serve both as an introduction for the student planning to continue his studies in geography and as a survey for the student who is concentrating on other disciplines. It combines descriptive geography with the analytical, historical factors with the contemporary, and physical geography with the human factors that influence man's activities.

Part I, "Man's Physical World", is concerned with the natural elements of the human habitat—landforms, soils, natural vegetation, water, climate, and the like—and an examination of the tools used in geographic study.

In Part II, "The World as the Home of Man", a generalized world regional climatic pattern is used as the basis for the study of man in relation to his natural environment. A climatic regionalization is employed, because the characteristics of the natural vegetation and the soil are greatly influenced by climate, and because the amount and distribution of rainfall and fluctuations in temperature have a great influence on the habitability of different areas.

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Geography is the field of learning that examines the characteristics of the surface of the earth. It consists of a systematic description of things on the face of the earth and an interpretation of their distribution. Thus, geography is primarily a science of areas and their inhabitants.

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The distinctive geographic character of any region is determined by the complex of areally associated natural and cultural features. ...

To study the cultural features, the human geography, of a region, it is first necessary to have a good understanding of its natural features, its physical geography, for human geography is built upon physical geography. The physical features of the earth, however, are not the final determinants of land utilization. Man is the final determinant, and man is very often influenced by forces that bear little or no relation to the physical characteristics of his habitat.

The relationships between man and his physical environment are actually interrelationships—not simple, one-way actions.

Elements within a natural environment never operate alone. They are both interrelated and interactional. ... Although one factor is usually considered the dominant force, ... in the operational sense the influences are derived from a combination of natural factors. These factors, therefore, interact.

The same interaction may be seen in the various activities in which man engages with other men. ... Man's economic activities as a whole necessarily reflect his ideas of government, education, and so forth. Still, we may think of man's role as a producer as the dominant factor among a series of factors. ...

Whenever the natural environment exerts an influence, man reacts. What his reaction will be depends upon numerous factors; once the influence is felt, however, man immediately adopts a behavior to bend it to his own use. ... The manner in which man utilizes this opportunity, if indeed he does, depends upon a combination of such factors as his technological capability, the materials he has to trade, his desire for goods, and the like. Should any of these human factors change, man's relationships to his natural environment ... change. There are, therefore, continual and changing interrelationships among men and the natural elements of their environment. (pp. vii,xiii,xiv)

20 chapters and Introduction
- Part I: MAN'S PHYSICAL WORLD
    - 1. The Earth As a Planet
    - 2. Continents, Islands, and Ocean Basins
    - 3. Landforms
    - 4. Soils, Natural Vegetation, and Water
    - 5. Weather and Climate
- Part II: THE WORLD AS THE HOME OF MAN
    - Low Latitude Rainy Climates
        - 6. Wet Tropics
        - 7. Wet-Dry Tropics
        - 8. Monsoon Tropics
    - Low Lattitude Dry Climates
        - 9. Low Latitude Steppe and Desert
    - Low Latitude Highland Climates
        - 10. Low Latitude Highlands
    - Subtropical Climates
        - 11. Mediterranean Subtropics
        - 12. Humid Subtropics
    - Cyclonic Climates
        - 13. Humid Continental Long Summer
        - 14. Humid Continental Short Summer
        - 15. Middle Latitude Steppe and Desert
        - 16. Temperate Marine
    - Middle Latitude Highland Climates
        - 17. Middle Latitude Highlands
    - Subarctic Climates
        - 18. The Subarctics
    - Polar Climates
        - 19. The Arctic
        - 20. Polar Icecaps

Heintzelman, Oliver H. and Richard M. Highsmith, Jr. World Regional Geography. 2nd edition (Englewood Cliffs, N.J.: Prentice-Hall, 1963) (3rd edition in preparation)

xvi + 391 pages; 360 figures: maps, graphs, diagrams, and photographs; selected references at the end of each chapter; index.

"Our goal remains ... to present a concise view of the earth as the home of man. This book provides a practical, logical, and systematic introduction to the field of geography, as well as a survey of world geography. The nature and elements of the field of study are examined briefly in Chapter 1, and then are emphasized throughout succeeding chapters as their functions become apparent. The world is divided into fourteen regional types. For each of these, the characteristics of the physical environment are first described and analyzed to determine potentialities and limitations. Man is then brought onto the scene, and his manner of living in the region, utilizing its endowments, and overcoming its restrictions are examined and explained. Each regional study is concluded with an Outlook section, which notes trends and possibilities for the future.

These basic understandings are essential in our world today, where overlapping interests in resources, trade, technology, culture, political ideology, and international policies are constantly evolving new meanings and importances.

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Geography is a correlative science, drawing together and combining the many facets of earth and man into complete mosaics to be viewed in their totality. It helps provide understanding of a nation's position in the world. It gives insight into the lives of people outside our own area by appraising the resources available to them and analyzing their manner of living, thereby giving us an understanding and appreciation of their problems and potentialities. Geography is concerned with the interrelationships of man and earth and with the significant ways in which they differ from place to place.

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The patterns of the earth's environment are a combination of natural and man-made products. The contributions of the natural or physical environment are everywhere interwoven with the results of man's utilization and development. The physical environment provides the base, the interdependent elements supplied by nature: climate and weather, landforms, water, vegetation, anomal life, soils, and minerals. The potentialities of the foundation vary with the different combinations of natural features. ... Some attractive areas produce high capabilities for supporting people; other repel man until new techniques enable him to cope with the adverse conditions. The variety of factors and the areal distribution of the possible combinations create the diversity of regions on the earth's surface that must be understood if we are to fully comprehend the problems or the possibilities confronting the world's people.

Man is the central theme in geography. The patterns of man's occupancy vary with his numbers and his stage of development, as well as with the potentialities of his physical environment. Through living on the natural foundation of earth and using its resources, man creates a superstructure—settlements, land utilization patterns, industries, and communication lines ... the human elements of geography.

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Clearly geography is a cross-field study concerned with analysis and correlation of two classes of interrelated elements, those that are supplied by nature, and those that are products of human occupancy. Some background in the geographic elements is desirable before proceeding with a regional study of the world. ... portions of Chapter 1, therefore, present a brief but succinct statement of the elements of regional geography. The purpose ... is to develop an understanding of the ingredients of the field and to allude to their significance and general patterns. ...

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The earth's surface is characterized by a great variety of physical and cultural patterns. Few areas are homogeneous in all aspects; however, large segments of the earth are often similar in one or more distinctive features, either physical or man-made. A geographic study of the world is facilitated by classifying it into regions on the basis of one or more elements. These may be physical elements such as landforms, climate, vegetation, or soil, or human elements such as land utilization patterns, economies, or culture.

When an analysis is made of the interrelated factors of the man-nature complex, climate appears to play the dominant role. Man and nature everywhere feel its impact. Under given climatic conditions there are similarities in natural vegetation, soils, crop possibilities, and shelter needs, as well as other physical and human conditions. Broad areas exist with climatic homogeneity; this makes possible a simple classification as an aid to the study and understanding of the earth's land and peoples.

This text presents a geographic appraisal of the world organized into 14 types of regions based on similarity of climatic characteristics. Study begins in the equatorial regions and progresses to the poles." (pp. vi-vii, 2-3, 24-25)

15 chapters:

1. Geography, the Correlative Science
2. Rainy Tropics
3. Wet-Dry Tropics
4. Monsoon Tropics
5. Tropical Deserts
6. Tropical Highlands
7. Dry Summer Subtropics
8. Humid Subtropics
9. Long Summer Humid Continentals
10. Short Summer Humid Continentals
11. Dry Continentals
12. Marine West Coasts
13. Middle Latitude Highlands
14. Subarctics
15. Polar Lands

1 appendix A. Maps and Photographs

Hoyt, Joseph Bixby. Man and the Earth. (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1962) (2nd edition in preparation.)

xviii + 521 pages; 190 maps and diagrams; 8 world and continental maps in color; many photographs; annotated selected bibliography at the end of some chapters; index.

"A preface should ... explain to those who are using the book how it has been organized and what has been included. Second, the preface should explain why the author has made the selection he has, and why he has arranged the material the way he has.

This book is divided into two approximately equal parts. Eight chapters are devoted to the physical phases of geography and seven to the cultural aspects. ... Chapters 3-10 present the earth, its landforms, climatic elements, climates, water, vegetation, soils, and mineral resources, while Chapters 1 and 2 and 11-15 examine man and his relationship to the various environments of the world. Chapters 1 and 2 are separated from the balance of the cultural section and placed first in the book because the author feels that man is the most important element of geography.

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Man and the Earth may serve those who prefer to teach geography through a regional approach if they will rearrange the chapters, beginning with Chapters 1 and 2 and then skipping to Chapters 11-15. The material in Chapters 3-10 may be brought in bit by bit at any time during the semester, or these chapters may be read as a unit after the students have acquired a greater curiosity about the physical elements. Both the systematic presentation of the physical elements of geography ... and the regional concept, which emphasizes the interrelatedness of all the elements of the environment, are essential to an understanding of geography. Having taught both, the author is unwilling to leave either out.

Each of the chapters on the physical aspects, as well as the one on man as an element of geography, is arranged internally to describe the origin or causes of the element, the varieties that exist, and their distribution around the world. ...

The cultural section of the text examines man's ways of living in the different environments of the world. To simplify the description, the several climatic regions have been grouped together into the humid tropics, the dry lands, the polar and subpolar regions, and the humid middle latitudes. Each chapter is arranged in a similar pattern. The physical environment is described in some detail, then the varying economies that man follows in each region are described. A series of vignettes of different ways of life in some of the regions that are not so well known ... have been deliberately chosen to present illustrations of some of the more intriguing culture groups from the far corners of our fascinating world.

Describing the several economies that exist in each of the groups of regions emphasizes the author's belief in man's relative freedom of choice. With varying degrees of effort, man is able to live as he wishes by the economy that he wants to follow in any of the climatic regions, with rare exceptions. Some regions offer man more than the others do in the way of resources. The physical attributes of some regions actually inhibit and certainly discourage man's carrying on certain activities. ... However, man's great ingenuity, his inventions, and, most of all, his control of large supplies of power are making him more and more independent of climatic and other physical limitations. In each region man can choose from a number of possible economies.

One feature that is worth comment here is the recognition in this text of the dynamic nature of man's relation to his environment. In the chapters on the underdeveloped parts of the world ... sections have been included showing the changes that are coming in these rapidly developing parts of the world. ... The descriptions ... are as up to date as the author can make them. ...

... This author ... began ... with a love of travel. Circumstances preventing the satisfaction of that desire, the author turned to books of travel. Here he was able to indulge, without stint, his curiosity about the far places of the world. ... As he traveled these various ways, he became more and more curious as to why they were as they were. Seeking an answer, he turned to the field which tries to explain—the field of geography. ... Enjoyment of geography grows with each year's contact with it. It is with this in mind that this text has been written, with a very frank hope that some of its readers will become geographers and that many will become geographiles." (pp. v-vii)

16 chapters:

Part One: MAN
1. Man as an Element
2. Man the Modifier

Part Two: THE PHYSICAL ENVIRONMENT
3. The Earth, Field of Study for Geography
4. Landforms
5. Climatic Elements
6. Climates and Their Distribution
7. Water Resources
8. Natural Vegetation and Animal Life
9. Soils
10. Mineral Resources

Part Three: MAN IN CLIMATIC REGIONS
11. Man in the Humid Tropics
12. Man in the Dry Lands
13. Man in the Polar and Subpolar Lands
14. Man in the Humid Middle Latitudes, Hunting-Gathering, Pastoral, and Agricultural Economies
15. Man in the Humid Middle Latitudes, Urban and Industrial Developments
16. Summary

1 appendix: A. Mapping the Earth

James, Preston E. A Geography of Man, 3rd edition, with Hibberd V.B. Kline, Jr. (Waltham, Mass.: Blaisdell Publishing Co., 1966)

xvii + 581 pp.; 103 specialized maps; 38 figures; photographs; 7 appendices; 14 continental and world reference maps; index; conversion scales for units of measure.

"A Geography of Man is designed for an elementary college-level course in world geography. The book is specifically concerned with the interrelations of man and his natural surroundings. The purpose is to develop geographic concepts, and to illustrate the methods of geographic analysis. Adequate factual content is presented to permit the application of geographic ideas, but the ideas are presumed to be more important than completeness of content. Two different kinds of concepts are developed: (1) concepts concerning the character and arrangement over the earth of the major physical-biotic systems that constitute the natural surroundings of man—the human habitats; and (2) concepts regarding the significance to man of these natural surroundings.

A system is made up of interdependent elements so organized that a change in any one element results in changes in all the others. Geography deals with spatial systems—that is, systems that occupy space on the face of the earth. To be sure, the whole surface of the earth, including its animal and human inhabitants, constitutes the only complete system. But the totality of interaction is far too complex for meaningful analysis. It is necessary, therefore, to proceed toward an understanding of the interrelations between man and habitat through the study of subsystems. . . . for the purposes of this book attention is first directed to the physical-biotic systems that are called habitats.

The physical-biotic systems, or ecosystems, must be simplified to provide a useful conceptual framework for the development of an elementary picture of world geography. This simplification involves the definition of categories of interrelated parts at the same degree of generalization. For the purposes of this book - a habitat is considered to be made up of associations of five elements: (1) surface features; (2) climates; (3) water; (4) wild vegetation; and (5) soils.

Nine groups of habitat regions are recognized, and these form the basis of organization for the main part of the text. Each is defined in terms of the association of these five elements in specific segments of earth-space.

These nine habitats are arranged on the earth's land masses in a predictable pattern ... described by the interplay of the principle of climatic regularity and surface irregularity.

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Geography is also concerned with the interrelations between man and habitat. What does the habitat mean to the people who must live and work in it? Is the habitat favorable or unfavorable? In examining these questions we come to one of the core concepts of modern geography: that the significance to man of the physical and biotic features of his habitat is a function of the attitudes, objectives, and technical skills of man himself. The habitat that is favorable to one group of people may prove unfavorable to another. A change in any of the elements of a culture, or way of living of a people, makes necessary the reappraisal of the habitat.

This concept is demonstrated, for selected places within each of the nine groups of regions, by examining the experience of man with the problems of making a living from earth resources. Man's experience with a particular habitat is examined historically. With each change in attitudes or objectives or especially in technology, the significance of the habitat is reexamined. . . .

For each period during which the culture remains essentially unchanged, the geography of man in relation to habitat is reconstructed. When changes in the culture take place, for whatever reason, the differences in the man – habitat relations are identified. (pp. vii-ix)

12 chapters:
    Introduction:
        The Habitat
    Introduction:
        Culture
    Group I:
        The Dry Lands
        The Habitat; The Occupance; Summary
    Group II:
        The Tropical Forest Lands
        The Habitat; The Occupance; Summary
    Group III:
        The Tropical Woodlands and Savannas
        The Habitat; The Occupance; Summary
    Group IV:
        The Mediterranean Scrub Woodlands
        The Habitat; The Occupance; Summary
    Group V:
        The Mid-Latitude Mixed Forest Lands
        The Habitat; The Occupance; Summary
    Group VI:
        The Mid-Latitude Grasslands
        The Habitat; The Occupance; Summary
    Group VII:
        The Boreal Forests and Woodlands
        The Habitat; The Occupance; Summary
    Group VIII:
        The Polar Lands
        The Habitat; The Occupance; Summary
    Group IX:
        The Mountain Lands
        The Habitat; The Occupance; Summary
    Conclusion:
        Principles and Problems of Man-Land Relations

7 appendices:
    A. Maps
    B. The Atmosphere
    C. The Lithosphere
    D. The Hydrosphere
    E. Vegetation
    F. Statistics
    G. References

James, Preston E. One World Divided. (New York: Blaisdell Publishing Co., 1964)

xiv + 482 pp.; 92 world and specialized maps; many photographs and tables; conversion scales for units of measure; list of references; index.

"The purpose of this book is to apply geographic methods and use geographic concepts in the search for meaning in the modern world. Many scholars have described the two sets of revolutionary changes now going on in the world—the technological changes and the many resulting readjustments which we call the Industrial Revolution, and the changes in the status and dignity of the individual which we call the Democratic Revolution. Social scientists have described the background and antecedents of these revolutions. The special purpose of this book, however, is to note the particular place or places on the earth where these movements originated, to discover the pattern and speed with which they spread, and to observe the results of the impact of change on pre-existing societies in particular places.

These two sets of fundamental change are in process of spreading over the earth. Both have given rise to strong reactions. As a result the world is becoming more and more sharply divided. The contrast between developed and developing nations, between rich and poor nations ... has become greater than ever before. At the same time the world is also sharply divided between those who favor one or the other of two basic political and social principles: democracy and autocracy. But these contrasts—between the economically developed and the economically underdeveloped, between the democratically organized and the autocratically organized—are more than abstract ideas. They are found in particular places, associated with particular kinds of habitats and resources, making impact with particular kinds of pre-industrial and pre-democratic institutions.

... The world can be divided into regions, each characterized by a distinctive set of reactions to the impact of revolutionary change. ... In each distinctive culture region, so defined, the significance to man of the features of the habitat changes with changes in the attitudes, objective, and technical skills of the inhabitants, requiring, therefore, repeated re-evaluations of the resource base of states.

The eleven culture regions presented in this book are, in a sense, a geographic hypothesis. It is assumed that the general picture of the contemporary world offered by this division into culture regions will serve to illuminate rather than obscure the nature of the processes of change that are at work. The regions are defined as contiguous areas because an important part of our analysis deals with the significance of position on the globe. They are defined in terms of political units because a major part of the analysis deals with the viability of states. It is recognized that the characteristics of each region are most clearly developed at the regional core, and that around the margins there are wide zones of transition where the characteristics of neighboring regions are mingled. Regional boundaries, therefore, are less important than regional cores. ...

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... The culture regions, as presented in this book, were outlined by intuitive judgment based on a wide variety of sources and some direct field observation. Clearly, this is an initial step in the work of providing a more precise description of the processes of change in the modern world.

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The purpose ... is to look at the modern world in the perspective of historical process and areal differentiation. The two revolutions and the reactions they set up have created a pattern of regional divisions, each characterized by a particular set of economic, social, and political conditions and problems. ...

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The purpose is to put the divisions of our one world into perspective. This is done by tracing the geographic changes through time, recognizing that the present geographic division of the world into culture regions is only the most recent such division, and that it is in no sense the end of the series. By understanding the causes and consequences of the regional divisions of the earth a background is created for the study of specific problems, or for the formulation of policies for action. (pp. vii-viii, xi, 31-33.)

13 chapters:

1. Introduction: The World's Culture Regions
2. The European Culture Region
3. The Soviet Culture Region
4. The Anglo-American Culture Region
5. The Latin American Culture Region
6. The North African-Southwest Asian Culture Region
7. The South Asian Culture Region
8. The Southeast Asian Culture Region
9. The East Asian Culture Region
10. The African Culture Region
11. The Australia-New Zealand Culture Region
12. Conclusion: The Search for Significance

4 appendices:

A. Climates of the World
B. Surface Features
C. World Vegetation
D. Reference Tables

Morris, John W. and Otis W. Freeman, editors, World Geography. 2nd edition, with contribution by 14 other authors (New York: McGraw-Hill Book Co., 1965)

x + 710 pp; 327 continental and specialized maps, photographs and charts; 24 tables; annotated references at the ends of chapters; glossary; index.

"World Geography is planned to give college and university students information about nations and continents to help them in their understanding of world affairs and the applications of geography in general. The editors have chosen the study of familiar geographic areas as the primary approach to world geography because they believe that this organization will help students to learn and remember essential facts and basic principles. The book proceeds, after a general introductory chapter, from areas close at hand to those more distant. ... Each chapter describes a unified area, although the factors that account for this unit are not always the same. The detail in which an area is studied depends, in part, upon its relative importance in world affairs. ... Because of the need for much greater knowledge of the United States, four chapters have been devoted to the study of the home country.

Throughout the text human activities have been related to the earth's relief features, climatic regions, and natural resources—soils, vegetation, supplies of water, and mineral deposits. After presenting the physical environment, the description of each area considers significant aspects of the cultural environment such as cities, industries, and other economic and cultural activities. Man succeeds most easily when he acts in harmony with nature, but modern man is not inevitably dominated by his environment, because his advancing technology has aided him in overcoming many natural handicaps. ... World Geography gives the student a conception of the broad patterns of human occupations, the distribution of population, and the important areas of commodity production. Its study contributes greatly to knowledge that will help students to understand, evaluate, and reach decisions about current world problems.

The text is intended to meet several needs. One is a survey of the countries and areas of the world to be included in the general education curriculum, especially where such a course is the only one the student will take. Another is a study of principles of geography, intended for a second course following the general survey. ... The book will also serve as a text for courses in world-regional geography.

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In preparing World Geography, the editors have called upon a team of specialists, all experienced teachers, who combine comprehensive knowledge about the regions they describe with awareness of what information is most essential for students. ..." (pp. vi-vii)

17 chapters, introduction and conclusion
- Introduction: World Geography
- Part 1: The Americas
  1. The United States: The Northeast
  2. The United States: The Midwest
  3. The United States: The South
  4. The United States: The West
  5. Canada and Greenland
  6. Middle America
  7. South America

Part II: The Old World

8. Northwestern and Central Europe
9. Southern Peninsular Europe
10. Eastern Europe: The Shatter Belt
11. Union of Soviet Socialist Republics
12. North Africa and the Near East
13. Africa South of the Sahara
14. Central Eastern Asia
15. South Asia
16. Southeast Asia
17. Australia, Oceania, and Antarctica

Conclusion: People in the Changing World

Murphey, Rhoads. An Introduction to Geography. 2nd edition, maps by John C. Sherman (Chicago: Rand McNally & Company, 1965)

xv + 734 pages; 104 regional maps; 19 world maps; 21 figures; 5 tables; photographs; annotated bibliographies for further reading at the end of each chapter; statistical appendix for 104 nations giving demographic and economic information as of mid-1965; index.

"The disciplines of geography and history, ... share a basically important role in general education, that of widening intellectual horizons. ... If man cannot adequately understand and manage himself and cannot adequately understand and live with the varying nature of the world community in its several parts, scientific and technical advances may at best be of limited usefulness and at worst destructively harmful. History and geography, as they attempt to widen man's broadest basic perspectives about himself by examining his accumulated historical experience and the variations in that experience over the world, aim to lay an essential foundation.

This suggests that a textbook should ... provide a body of selected information and a body of ideas which together will be useful and reliable beginning guides toward understanding, and it should encourage a maximum of individual thinking and application. ...

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... This book's objective is only secondarily information and primarily the development of geographic ideas and the geographic approach to the study of man. ...

The first section of the book explores the nature of geography, the kinds of problems which it investigates, the methods which it uses, and the subtle implications of man's changing interrelationship with the earth which he inhabits. The second and larger section provides a series of regional studies in which the evolution of settlement, culture, economy, and political forms in each area is treated in historical perspective as well as in a current context. These samples of regional analysis attempt to convey an understanding of each area in its various aspects and to apply the ideas developed in the first section to the principal core of geography, the total study of areas in their spatial frame, or their pattern of arrangement on the earth. Not all of the world is treated, nor can any of the regional chapters attempt to deal completely with a regional totality, given the obvious limitations of space. ... Each regional chapter ... focuses on one or a few leading characteristics of the area which it treats or on one or two major ideas, used as threads to tie together the interpretation of the region. ...

... The regional chapters, however, may be read separately, dealt with in different order, or selected from as circumstances suggest, without confusing the reader or harming the book's purpose. No compulsion has been felt to apportion space evenly among regions, but only to provide samples of the study of a number of important regions.

The book is designed to be used with an atlas." (pp. 1-3)

Introduction and 36 chapters:

1. Geography and Social Science
2. Spatial Form and Spatial Interaction
3. The Environmental Factor
4. The Region
5. The Physical Environment and Its Role: I. The Climatic Influence
6. The Workings of Climate
7. The Physical Environment and Its Role: II. Vegetation

8. The Physical Environment and Its Role: III. Soils
9. The Physical Environment and Its Role: IV. Water Resources
10. The Physical Environment and Its Role: V. Landforms
11. Resources and What They Mean
12. Europe: A General Geographic Introduction
13. Britain and the Modern World
14. Highland Britain and Ireland
15. Scandinavia: Poverty and Progress
16. The Low Countries: The Netherlands and Belgium
17. France Within Europe
18. The State and the Problem of Germany
19. Frustrations and Opportunities in Central Europe
20. The U.S.S.R.: The Gift and Problem of Space
21. The Mediterranean: Land and Sea
22. Italy: Diversity and Human Genius
23. Man and the Land in Monsoon Asia
24. The Indian Subcontinent: Between Two Worlds
25. The Subcontinent Decides and Plans
26. The Middle Kingdom: Splendid Isolation
27. Changes on the Good Earth
28. The Japanese Achievement and the Problem of Korea
29. Southeast Asia: Tropical Islands, Deltas, and the Sea
20. The Dry World: Civilization and Conflict
21. Contemporary States and Issues in the Dry World
32. The Dark Continent and Its Modern Development
33. African Regions
34. Latin America; A Blend of Indian and European
35. Latin American Regions
36. Anglo-America: A Modern Prodigy

Philbrick, Allen K. This Human World. (New York: John Wiley & Sons, Inc., 1963)

v + 500 pp.; 260 figures; world and specialized maps, photographs, and diagrams; 46 tables; apoendix; index.

"The context of this book is the world today. ...

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... The evolution of the pattern and organization of area characteristic of man's occupancy of the earth is the product of two elements, human culture and material resources, which are united in life by the force of human volition. Regional analysis will demonstrate ways in which the cutting edge of human creative imagination provides leadership, while the natural and cultural environments supply challenge and opportunity. The perspective used throughout the book is that perceptive innovation is the force by which man has evolved his own pattern of occupancy using the materials of his earthly estate. The transmission and acceptance of creative innovation in the activities of an increasing number of people result in a spatial distribution of human culture which is the subject of cultural geography.

The plan of This Human World is the interweaving of several threads, which are commented on below. The traditional division of geography into systematic and regional treatments may be observed in the organization of the material of the first five chapters and the remaining fifteen. The first five chapters describe the world systematically in three main subdivisions – physical, cultural, and organizational. The remaining fifteen regional chapters are also divided into three parts. ... the analysis of Europe ... the Americas and their focus on the United States and Canada ... the division of the old-world Eurasian land mass into the Communist Bloc and the regions of the Eurasian perimeter. ... Chapter 20 summarizes world regional organization.

The major theme of this book is the origin and spread of a wider-than-local division of labor, defined as exchange-type area organization. In developing this idea it is demonstrated that only the processes of cultural evolution can account for the specific innovations which brought about this revolution in the geographical distribution of human activities and their complex interconnections. The regional treatment begins with England and Europe because the evolution of a wider-than-local division of labor involves the geography of the English and European industrial revolution and its dissemination by Europeans throughout the world. The impact of the distribution of European culture is traced geographically in England, Europe, Africa south of the Sahara, and in selected Commonwealth countries.

The scene then shifts to the Americas, where the great migration of European and African peoples from the time of the Age of Discovery is examined in its geographic context of material resources and divergent cultural evolution. A return to the Old World portrays the very different cultural evolution as the double continent of Eurasia is analyzed in terms of the Communist Bloc and the complex cultures of the Eurasian perimeter regions – North Africa and Southwest, South, Southeast, and East Asia.

In the concluding chapter the schism in the world between Communist, free world, and neutral regions is brought into sharp focus. The relation to the theme of the book of the present stalemate in the struggle for power and influence within the human race is made clear. The struggle is being waged primarily by the peoples of three regions represented by the Americas, Europe, and the Communist Bloc. ... Successive waves of European culture have swept across the face of the earth and have broken around and over the unyielding masses of Asians. The impact of the Industrial Revolution is only now for the first time substantially affecting the reorganization of area there. The processes of cultural evolution and the understanding and use of the earth's resources for the development of a truly stable pattern of world organization are approaching a crisis of leadership. The perspective of geography is essential to an understanding of the future of this human world." (pp. i-ii.)

20 chapters:

Part I: SYSTEMATIC GEOGRAPHY

1. A Geographic Point of View
2. Principles and Regions of Human Organization
3. Warmth and Water
4. Land and Life
5. The Cultural Aspect of Geography

Part II: WORLD REGIONAL GEOGRAPHY

6. The United Kingdom
7. The Geographical Impact of the Industrial Revolution in England
8. Europe
9. The Paradox of European Regional Organization
10. Africa South of the Sahara
11. Australia, New Zealand, and the Republic of South Africa
12. Resources of the Americas
13. The Area Organization of the Americas
14. The Peopling of the Americas
15. The Regions and Peoples of Eurasia
16. The Resources of Eurasia
17. Area Organization of Communist Bloc Countries
18. The Eurasian Perimeter
19. Regions of the East Eurasian Perimeter
20. World Regional Organization

1 appendix: Average Temperatures and Precipitation of 71 Selected Stations

Russell, Richard J., Fred B. Kniffen, and Evelyn L. Pruitt. Culture Worlds. Brief Edition (New York: The Macmillan Company, 1961)

xiv + 476 pp.; 141 world and specialized maps; 9 tables; many photographs; index.

"More than twenty years have elapsed since the Culture Worlds approach to geography at the first-year level was initiated. ... an excellent background is provided for students who continue with other courses in geography. Students unable to continue retain a valuable understanding of the earth's parts and peoples.

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Culture Worlds was written with the idea in mind that all students would be required to own a reasonably good atlas. ...

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Geographers are interested in culture traits and cultures in general because they provide a rational and fundamental basis for dividing the earth's surface into its most significant parts. Peoples who are closest akin culturally tend to modify landscapes in similar ways so that they live in places that physically resemble their homelands, and they alter the landscapes in ways to which they are accustomed. ...

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... There are relatively few first order divisions between cultures, and they separate the main groupings of mankind's culture worlds. Each culture world, of course, contains within it some variety of peoples and culture traits, but these local variations are minor in contrast to the dominant characteristics that unify each culture world, and are quite insignificant in comparison with the differences that exist between culture worlds. To distinguish local differences within a culture world, there are divisions of the second order, each of which is a culture realm. Within each realm there may be smaller units, culture regions.

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Individual assemblages of people possess characteristic culture traits that enable social scientists to group peoples according to their cultures. The broadest of these groupings are culture worlds. Seven of these are so distinctive that they form an excellent basis for introducing students to the field of geography. These broadest divisions of the earth are the European, Dry, African, Oriental, Polar, Pacific, and American worlds. Each has subordinate realms and regions. The pattern of life in each culture world has come about through a long and complicated series of events and experiences which have left their imprint on the landscape. Within the last few centuries the European World has undergone amazing expansion, a movement recognized as the New World Revolution.

The primary interest of the geographer is in the earth as it exists today. He seeks to understand and explain its surface. In most places he finds man, knowingly or unawares, changing the face of the earth. The type of changes varies in accordance with the culture group concerned, for the forms of the cultural landscape are a complex expression of man's culture, superposed upon or replacing the forms of the natural landscape. Each culture world has its own characteristic culture traits and its own typical cultural landscape. An entrance into the field of geography can best be made through a study of these culture worlds." (pp. v, 3-4, 9)

26 chapters:

- Culture Worlds
    - 1. Culture Worlds
- Polar World
    - 2. Polar World
- European World
    - 3. Europe: Small, but Diverse
        - Northwestern European Realm
            - 4. British Isles
            - 5. Scandinavian Lands
            - 6. Low Countries
            - 7. Germany
        - Eastern European Realm
            - 8. Eastern Europe
        - Shatter Belt
            - 9. Shatter Belt
        - Mediterranean Realm
            - 10. Mediterranean Realm
        - Western Transition Zone
            - 11. France, Switzerland
- Dry World
    - 12. Dry World
        - Arab-Berber Realm
            - 13. Arab-Berber Realm
        - Turko-Mongolian Realm
            - 14. Turko-Mongolian Realm
- African World
    - 15. Natural Setting and Peoples
    - 16. Modern Cultural Landscapes
- Oriental World
    - 17. Asia
        - Indian Realm
            - 18. Indian Realm
        - Chinese Realm
            - 19. Chinese Realm
        - Malayan Realm
            - 20. Malayan Realm
        - Indo-Chinese Shatter Belt
            - 21. Indo-Chinese Shatter Belt
- Pacific World
    - 22. Pacific World
- American World
    - 23. Physical and Cultural Background
        - Anglo-American Realm
            - 24. Anglo-American Realm
            - 25. Anglo-American Realm, continued
        - Latin American Realm
            - 26. Latin American Realm

Wheeler, Jesse H., Jr., J. Trenton Kostbade, and Richard S. Thoman. Regional Geography of the World: An Introductory Survey. Revised edition (New York: Holt, Rinehart, and Winston, 1961)

xi + 674 pp.; many maps and photographs (both unnumbered); 32 tables; index.

"This revised edition ... seeks to assist college and university students in acquiring certain basic ideas and supporting facts about contemporary world geography which a person with a college education might reasonably be expected to know. Its aim, in short, is general education in world geography. In surveys the world importance, geographical characteristics, and major problems of eight world regions—Europe, the Soviet Union, the Middle East, the Orient, the Pacific World, Africa, Latin America, and Anglo-America. Attention is also given to important individual countries and regional groups of countries within each world region. Pertinent background material on systematic physical and cultural geography is presented at appropriate places. A general introduction to geography as a field of study is presented in Chapter 1. The book is designed as a text for courses in world regional geography on an introductory college level.

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... Although most of the text has been specially written, a variety of readings, mostly short, are included; ...

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The main reason for studying geography is to gain a better understanding and appreciation of the world in which we live. ... Geography ... centers attention on the study and interpretation of particular areas on the world. A well-known geographer, George B. Cressey, has stated this idea as follows: 'It is the task of geography ... to draw information from widely scattered sources, and to give it a new significance as applied to the understanding of specific areas.'

The term 'area', as used by geographers, may refer to any portion of the earth's surface. ... In this book primary attention is given to two kinds of areas, the countries as outlined on an ordinary political map and the major world regions in which the individual countries lie.

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The scheme of eight major world regions employed in this book is only one among various alternative methods of subdividing the world for purposes of study. However, it is believed to be especially well suited as an organizing device for accomplishing the major objective ... to assist the student in acquiring a fund of concepts about the geography of the contemporary world that an educated person might reasonably be expected to know.

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To the student ... the mass of detail to be mastered may seem at first to be overwhelming. However, the observant student will note that certain topics tend to recur as different regions and countries are studied. These key topics include (1) Location, (2) Population, (3) Political Status, (4) Natural Environment, (5) Type of Economy, (6) Potentialities, and (7) Problems.

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It is important for the student to realize that the geographic study of an area is not confined merely to consideration of a list of topics. ... In geographic study one tries to understand and appreciate the ways in which the features of an area are related to each other." (pp. v, 3,4,9,20).

27 chapters:

- Part 1: INTRODUCTORY CONCEPTS
  - 1. Some Introductory Concepts of Geography
- Part 2: Europe
  - 2. Introduction to Europe
  - 3. The British Isles
  - 4. France
  - 5. Germany
  - 6. The Benelux Countries
  - 7. Switzerland and Austria
  - 8. Countries of Northern Europe
  - 9. Countries of Southern Europe
  - 10. Countries of East Central Europe
- Part 3: THE SOVIET UNION
  - 11. Introduction to the Soviet Union
  - 12. Population and Major Territorial Division of the USSR
- Part 4: THE MIDDLE EAST
  - 13. Introduction to the Middle East
  - 14. Individual Middle Eastern Countries and Their Characteristics
- Part 5: THE ORIENT
  - 15. Introduction to the Orient
  - 16. The Indian Subcontinent
  - 17. Southeast Asia
  - 18. The Chinese Realm
  - 19. Japan and Korea
- Part 6: THE PACIFIC WORLD
  - 20. The Pacific Islands
  - 21. Australia and New Zealand
- Part 7: AFRICA
  - 22. Introduction to Africa
  - 23. Political and Regional Geography of Sub-Saharan Africa
- Part 8: LATIN AMERICA
  - 24. Introduction to Latin America
  - 25. Latin American Regions
- Part 9: ANGLO-AMERICA
  - 26. Introduction to Anglo-America
  - 27. Anglo-American Regions

INTRODUCTION TO GEOGRAPHY—A SPATIAL APPROACH

A ONE-SEMESTER COURSE OUTLINE

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ACKNOWLEDGEMENTS

The authors gratefully acknowledge the help and guidance of the following academicians who served as consultants and discussants at various stages in the development of the course outline.

Dr. Lawrence A. Brown, Department of Geography, University of Iowa
Dr. Edward B. Espenshade, Jr., Department of Geography, Northwestern University
Dr. Clyde F. Kohn, Department of Geography, University of Iowa
Dr. James B. Lindberg, Department of Geography, University of Iowa
Dr. Harold H. McCarty, Department of Geography, University of Iowa
Dr. Harold L. McConnell, Department of Geography, University of Iowa
Dr. William Warntz, Professor of Theoretical Geography, Harvard University

We are likewise indebted to Dr. John F. Lounsbury, Project Director, Commission on College Geography, for his help and encouragement during the initial stages of the project.

CONTENTS

Page

PART I. INTRODUCTION: THE UNDERLYING PHILOSOPHY 114
Duration of the Course 115

PART II. AN EXAMPLE OF THE SPATIAL APPROACH IN THE STUDY OF GEOGRAPHY USING THE PROBLEM-SOLVING METHOD 116
Example No. 1: Understanding the Location of Manufacturing Activities 116
Example No. 2: Analysis of the Distribution of the Aged Population in Wisconsin 118

PART III. CONCEPT OF LOCATION: THE DESCRIPTION OF LOCATION ON THE EARTH'S SURFACE 122
Place Name or Nominal Systems. 123
Co-ordinate Systems. 123
Angle-Distance Systems 124
Unit Area Systems 124

PART IV. DISTRIBUTIONS AND SURFACES: THEIR NATURE AND GENERAL CHARACTERISTICS 125
Continuous and Discrete Phenomena 125
Ways of Representing Spatial Distributions and Surfaces 125
Properties of Distributions and Surfaces 130
Nearest Neighbor Analysis. 131
Sampling. 134

PART V. TYPES OF SURFACES AND DISTRIBUTIONS 140
Density-Decline Surfaces. 143
Isochronic Surfaces 145
Iso-Cost Surfaces. 147

PART VI. THE SPATIAL FACTOR IN INTERACTION 149
Spatial Interaction Chart 150
Agriculture/Urban Land Use Notions 152
Spatial Interaction, Gravity, and Potential Models 152
· "Models" 153
Computation for a Potential Map 156
Application of Gravity Model 156
Spatial Interaction and Diffusion 157
Spatial Interaction and Central Place Theory. 161
Spatial Interaction, Gravity Models and Potential Models (Continued) 165

INTRODUCTION TO GEOGRAPHY—A SPATIAL APPROACH

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PART I. INTRODUCTION: THE UNDERLYING PHILOSOPHY

For the past several years, the faculty of the Department of Geography, The University of Iowa, has been aware of the need for a new Introduction to Geography course. Such a course would make geographically significant facts more meaningful to students by helping them develop a conceptual structure of the discipline. It was decided, therefore, to design a course that would not only serve as an introductory, supplementary, course for the propsective undergraduate major in Geography, but one that would be of value in a liberal education program no matter what the specific interests of the student might be. It is hoped, further, that by presenting such a course, the undergraduate will develop a more positive attitude towards Geography, and an enthusiasm for its role in the general world of knowledge.

Until the last decade or so, Geography teachers focused most of their attention on statements of largely unrelated facts about one region after another and on the memorization of these facts. Currently, rote learning is no longer approved. Unlike a certain young man described by Charles Dickens in his novel, Hard Times, the student is no longer expected to know....

> about all the water sheds of all the world, and all the histories of all the peoples, and all the names of all the rivers and mountains, and all the productions, manners, and customs of all the countries, and all their boundaries and bearings on the two-and-thirty points of the compass.

Instead, the current emphasis is designed to acquaint students with Geography as a fundamental research discipline which can contribute to their understanding of the physical world and human society.

Many educators today accept the theory, advanced by Jerome Bruner,[1] that the key to knowledge and understanding lies in the mastery of the organizing concepts of a given field of learning. They adhere to the belief that it is the responsibility of the classroom teacher to help students think in terms of the basic notions or organizing ideas of a discipline. Thus, by observing teachers at work and by trying out for themselves some of the techniques demonstrated, students should soon discover:

(1) What it is geographers want to know, that is, the kinds of problems they want to solve and the kinds of questions they ask; and
(2) How they find out, by means of mapping, statistical analysis, research in the library, the use of many data sources, field work in town and country—and plain reflective thinking.

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[1] Jerome S. Bruner, On Knowing (Cambridge, Massachusetts: Harvard University Press, 1962), p. 120.

Although several traditions can be identified in the study of Geography, basically all academicians in the field share a common goal. They are interested in discovering, describing, and accounting for the location, distribution, and spatial association of things as they occur on the face of the earth as a whole, or in any part of it.

Locations and distributions of natural or cultural phenomena may be studied in one of two major ways. One of these is to examine them in the manner in which an artist might portray a landscape or a poet might sense its meaning, that is, from a subjective point of view. The other is to describe and interpret the location, distribution, and spatial associations in such a manner that others might verify the results, that is, from an objective point of view. Choosing between these alternatives is a matter of taste rather than of logic, because both viewpoints can be defended, and both can be scholarly. However, the development of one approach involves very different sorts of learning experiences than the other. In any event, we have elected to choose the latter, that is, the scientific rather than the artistic approach.

In choosing this approach, geographers accept the notion that their discipline is concerned with problem-solving, and that the problems appropriate for research in Geography involve discovering, describing, and understanding the location and distribution of phenomena, both natural and cultural, on the earth's surface.

The acceptance of a problem-solving approach in Geography also involves the acceptance of some rather strict rules of intellectual behavior in the use of a rather large and expanding body of methods and techniques which science has found extremely useful. Four steps in the geographer's methods of inductive inquiry may be recognized. These are: (1) recognition and statement of a problem having spatial aspects; (2) formulation of a hypothesis or alternative solution to the problem; (3) testing of the hypothesis or alternative solution by means of relevant data; and (4) acceptance or rejection of the hypothesis or alternative solution and evaluation of consequences.

It will be recognized that the steps listed above do not differ in any significant way from those commonly accepted as steps in reflective thought, and together are often referred to as the scientific method. Only the nature of the problem, the kinds of hypotheses developed, and the nature of the relevant data differ from problems calling for reflective thought in other disciplines.

It should also be emphasized that in following this approach the stress is placed on: (1) the collection and use of data to describe problem situations, (2) the employment of appropriate cartographic or mathematical-statistical techniques to facilitate comprehension of these problems, and (3) the selection and use of suitable systems of measurement for verifying the validity of the selected hypotheses.

Duration of the Course

Introduction to Geography—A Spatial Approach is designed as a one-semester course. Specifically, a semester is here defined as a sixteen-week period consisting of three (fifty-minute) class contact hours per week. Excluding holidays and scheduled exams there are normally about forty class contact hours per semester. In any event, the present outline is designed to conform to a one-semester course of approximately forty contact hours.

PART II. AN EXAMPLE OF THE SPATIAL APPROACH IN THE STUDY OF GEOGRAPHY USING THE PROBLEM-SOLVING METHOD

In order to help undergraduate students acquire a spatial approach to the understanding of past, present, or future events, it is believed that they should be confronted with problems to study, criticize, and emulate. In keeping with this philosophy, problem-solving, leading to the development of spatial relationships, has been selected as the method to acquaint students with the modes of thought and techniques that characterize modern geography.

Discovering relationships can be exciting. It is not difficult for students to become interested in the study of geography if they can sense the problem which is to be solved, and if they are acquainted with the methods used to solve it. Acceptance of the problem-solving approach, in its most elementary form, involves (1) collecting and mapping facts related to clearly-defined variables (having spatial dimensions), (2) studying the spatial distributions thus portrayed, (3) stating hypotheses, (4) testing hypotheses, (5) accepting or rejecting the hypotheses, and (6) evaluating the consequences.

The two problems discussed below provide examples which might be used to introduce a course stressing the spatial approach to gaining geographic knowledge.

Example No. 1: Understanding the Location of Manufacturing Activities

The extensive literature of location theory as applied to manufacturing activities and plant locations provides us with a well-defined body of knowledge that is admirably suited for the purpose of introducing students to the spatial approach using the problem-solving technique. However, it should be stressed that the instructor is not to present everything that is currently known about the location of manufacturing activity. If a student is to learn to think and perform as a geographer it is important that he knows how the geographer acquires his knowledge. It is even more basic, however, that he knows how to ask questions that can be studied. In any case, knowing how to ask questions having geographic relevance is the first step in the learning process, and the acquisition of this ability is the primary goal of this first example.

One of the first tasks in problem-solving is to identify precisely the phenomena being studied. Such identification is necessary in order to communicate, evaluate, criticize and make use of the work being done.

Once the topic and the unit area used for counting—that is, the scale—are decided upon, the "facts" of a distribution may be assembled. When the "facts" are mapped the map really becomes a statement of the problem, revealing as it does variations in the distribution of a specified phenomenon. Thus, we are confronted with the problem of discovering a hypothesis or hypotheses that will account for the areal pattern (patterns) we have discovered. The search for acceptable hypotheses may lead us into a variety of fields such as economics, climatology or politics to mention a few. It may also lead us to a consideration of historic as well as current factors.

Locating a Plant for the Production of Ethylene Glycol, a Permanent-Type Antifreeze

The following lines of advance are offered in order to develop a more "geographic" approach to the problem of locating an antifreeze plant, using the lecture-demonstration technique.

(1) An automotive specialty company hires a geographer to locate a plant for the manufacture of permanent-type antifreeze.

(2) The geographer selects two variables that appear to be logically related to the sale of antifreeze and the size (volume) of the market. The variables are: (1) the average annual minimum temperature of an area, and (2) automotive registration by area—that is, by county or state. At this point the geographer decides to substitute density of population for automotive registration. The rationale being that the ratio of automobiles, trucks, and buses per capita is fairly uniform throughout the United States.

(3) The two variables: (1) average annual minimum temperature for the U.S., and (2) population density of the U.S. are mapped. (The average annual temperature map for the U.S. provides an opportunity to introduce isotherms)

(4) Next, the geographer compares the maps. Based on map comparisons he selects that area or region where sales volume is greatest—the Northeast-Great Lakes region. Thus far, he has rather crudely isolated the major market area for antifreeze.

(5) At this stage of the investigation the consultant is unable to state whether the plant should be located in the major market area or not. The geographer must of necessity consider the technological aspects of production and the possibility of regional cost differentials.

(6) Ethylene glycol, the basic component of permanent-type antifreeze, is derived from ethane, a raw material gas contained in natural gas. Table 1 lists the raw materials, utilities, and labor inputs that may lead to regional cost differentials.

TABLE 1. PRODUCTION OF ETHYLENE GLYCOL FROM ETHANE[2]

Selected Inputs	Requirements per 100 Pounds of Ethylene Glycol
Ethane	108 lb.
Utilities	
Fuel gas	377 cu.ft.
Steam	1248 lb
Electric Power	10 kw-hr.
Labor	0.19 man-hours

(7) It is assumed that labor inputs and labor costs do not differ regionally—i.e., labor costs are held constant since the petrochemical industry is highly unionized. Thus, the critical element in the cost of producing ethylene glycol appears to be related to regional differentials in the cost of natural gas. In essence, these regional variations are based on pipeline transport costs (cost of overcoming the friction of distance).

(8) The apparent significance of natural gas leads the geographer to construct a map of marketed natural gas in the U.S. The dominant position of Texas and Louisiana as sources of marketed natural gas is readily observed.

(9) To simplify the plant location procedure let us assume that the geographer has narrowed his plant location choice to a raw materials region near Monroe, Louisiana, on the Mississippi River and a market-oriented location at Cincinnati, Ohio.

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[2] Walter Isard, _et al_. _Methods of Regional Analysis: An Introduction to Regional Science_ (New York: Wiley, 1960, p. 237.

(10) The problem is now one of comparative costs between the raw materials region and the market-oriented location—in essence, it is a problem of transport inputs.

(11) The geographer prepares two tables to illustrate the transport differentials.

TABLE 2. TRANSPORT COST DIFFERENTIALS PER 100 POUNDS OF ETHYLENE GLYCOL[3]

Shipment of Product by Barge

	Transport Cost on:			
Location	Equivalent Natural Gas	Finished Product	Total Transport Cost	Net Advantage of Monroe
Monroe	0	$.16	$.16	$.13
Cincinnati	$.29	0	$.29	

TABLE 3. TRANSPORT COST DIFFERENTIALS PER 100 POUNDS OF ETHYLENE GLYCOL[4]

Shipment of Product by Rail

	Transport Cost on:			
Location	Equivalent Natural Gas	Finished Product	Total Transport Cost	Net Advantage of Cincinnati
Monroe	0	$.89	$.89	
Cincinnati	$.29	0	$.29	$.60

(12) After examining both tables and considering that barge transportation from Monroe to the market area is feasible, it is obvious to the geographer that the plant location near Monroe, Louisiana, is desirable.

The foregoing analysis by no means exhausts the variables that might be included in the problem. Economies of scale (large vs. small plant) have not been considered. In a like manner, alternate market or raw material locations have been excluded.

Example No. 2: Analysis of the Distribution of the Aged Population in Wisconsin

In the previous section the lecture-demonstration technique was employed. This part has as its goal active student participation in problem-solving. For purposes of illustration the spatial distribution of the aged population in Wisconsin has been selected as a suitable topic for student analysis. Table 1 provides some of the factual elements—others that may be pertinent to the analysis are readily available in the Census.

Colored pencils and a liberal supply of Wisconsin county outline maps are needed to complete this exercise.

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[3] Ibid., 238

[4] Ibid.

TABLE I

Total Population, Number and Proportion of Population Aged 65 and Over, Percentage of Total Population Living in Urban Centers in 1960, and Percentage Change in Total Population between 1950-1960 in Wisconsin Counties. (Counties ranked according to the proportion of the population aged 65 or more in 1960)

County and Rank	Total County Population	No. of Persons Aged 65-Over	Per Cent of Total Pop. Aged 65-Over	Per Cent of Pop. Living in Urban Centers	Per Cent Change in Total County Pop. 1950-1960
1. Marquette	8,516	1,494	17.5%	0.0%	- 3.7%
2. Adams	7,566	1,296	17.1	0.0	- 4.3
3. Burnett	9,214	1,484	16.1	0.0	-10.0
4. Waushara	13,497	2,102	15.6	0.3	- 3.0
5. Waupaca	35,340	5,377	15.2	36.3	+ 0.8
6. Sawyer	9,475	1,415	14.9	0.0	- 8.2
7. Bayfield	11,910	1,730	14.5	0.0	-13.4
8. Washburn	10,301	1,463	14.2	0.0	-11.7
9. Price	14,370	2,032	14.1	20.3	-12.1
10. Trempealeau	23,377	3,303	14.1	0.0	- 1.5
11. Juneau	17,490	2,452	14.0	20.2	- 7.6
12. Green Lake	15,418	2,135	13.8	31.1	+ 4.5
13. Ashland	17,375	2,339	13.5	58.3	-10.7
14. Columbia	36,708	4,959	13.5	30.8	+ 7.9
15. Vernon	25,663	3,467	13.5	15.3	- 8.0
16. Pepin	7,332	972	13.3	0.0	- 1.7
17. Forest	7,542	992	13.2	0.0	-20.1
18. Jackson	15,151	1,981	13.1	21.1	- 5.7
19. Polk	24,968	3,280	13.1	0.0	+ 0.1
20. Langlade	19,916	2,568	12.9	48.7	- 9.4
21. Richland	17,684	2,275	12.9	26.8	- 8.1
22. Door	20,685	2,645	12.8	35.5	- 0.9
23. Iowa	19,631	2,507	12.8	14.8	+ 0.1
24. Sauk	36,179	4,633	12.8	30.5	- 5.1
25. Clark	31,527	4,000	12.7	8.7	- 2.9
26. Green	25,851	3,290	12.7	31.1	+ 6.9
27. Vilas	9,332	1,188	12.7	0.0	- 0.3
28. Barron	34,270	4,305	12.6	21.3	- 1.2
29. Jefferson	50,094	6,333	12.6	50.7	+16.3
30. Marinette	34,660	4,353	12.6	45.7	- 3.0
31. Pierce	22,503	2,834	12.6	18.8	+ 4.9
32. Monroe	31,241	3,914	12.5	36.5	- 0.4
33. Rusk	14,794	1,843	12.5	24.2	-11.9
34. Dunn	26,156	3,232	12.4	33.0	- 4.3
35. Iron	7,830	967	12.3	35.3	-10.1
36. Lincoln	22,338	2,753	12.3	57.3	+ 0.5
37. Oconto	25,110	3,101	12.3	19.1	- 4.3
38. Douglas	45,008	5,427	12.1	75.4	- 3.7
39. Grant	44,419	5,368	12.1	29.9	+ 7.1
40. Shawano	34,451	4,148	12.1	17.8	- 2.5
41. Walworth	52,368	6,290	12.0	37.7	+25.9
42. Buffalo	14,202	1,691	11.9	0.0	+ 3.5
43. Florence	3,437	406	11.8	0.0	- 8.5
44. Lafayette	18,142	2,132	11.8	0.0	0.0
45. Fond du Lac	75,085	8,765	11.7	58.0	+10.7
46. Crawford	16,351	1,888	11.5	34.5	- 7.4
47. Sheboygan	86,484	9,949	11.5	63.5	+ 7.3
48. Taylor	17,843	2,028	11.4	18.3	- 3.3
49. St. Croix	29,164	3,254	11.2	28.3	+12.6

TABLE I (Cont.)

County and Rank	Total County Population	No. of Persons Aged 65-Over	Per Cent of Total Pop. Aged 65-Over	Per Cent of Pop. Living in Urban Centers	Per Cent Change in Total County Pop. 1950-1960
50. Dodge	63,170	7,034	11.1%	46.8%	+ 9.6%
51. La Crosse	72,465	7,874	10.9	70.0	+ 7.2
52. Kewaunee	18,262	1,973	10.8	36.2	+ 5.3
53. Oneida	22,112	2,394	10.8	39.8	+ 7.1
54. Chippewa	45,096	4,836	10.7	33.9	+ 5.3
55. Eau Claire	58,300	6,107	10.5	63.9	+ 7.6
56. Portage	36,964	3,831	10.4	48.3	+ 6.0
57. Manitowoc	75,215	7,544	10.0	62.4	+12.0
58. Winnebago	107,928	10,841	10.0	72.1	+18.5
59. Rock	113,913	11,007	9.7	69.7	+22.5
60. Calumet	22,268	2,060	9.3	20.3	+18.2
61. Marathon	88,874	8,295	9.3	46.8	+10.6
62. Kenosha	100,615	9,238	9.2	72.4	+33.7
63. Washington	46,119	4,221	9.2	33.8	+36.0
64. Milwaukee	1,036,041	94,490	9.1	100.0	+18.9
65. Racine	141,781	12,971	9.1	72.6	+29.4
66. Wood	59,105	5,361	9.1	53.7	+17.0
67. Brown	125,082	10,195	8.2	77.7	+27.2
68. Dane	222,095	18,293	8.2	75.4	+31.1
69. Outagamie	101,794	8,082	7.9	67.3	+24.6
70. Ozaukee	38,441	2,871	7.5	67.9	+64.6
71. Waukesha	158,249	10,858	6.9	65.1	+84.2

(1) The first step is to introduce students to the appropriate cartographic techniques needed in the problem analysis. As a minimum, it is expected that choropleth mapping will be stressed.

(2) Have the students map the dependent variable—per cent of the population 65 and over, by county. (Some background items of interest: (1) The 1960 Census of population reported 402,736 persons aged 65 and over in Wisconsin or a figure equal to 10.22 per cent of the state's population. This compares with 9.23 per cent for the United States. Of the 402,736 persons aged 65 and over in Wisconsin, 154,730 were reported as residing in the rural areas. Or stated differently, one person out of nine (10.8 per cent) in the age group 65 and over was residing in the open country, small towns, or on farms—a proportion substantially higher than that in the urban area.)

(3) Discuss the "highs" and "lows" of the mapped distribution. Solicit student participation in hypothesizing independent variables that may help in accounting for the observed "highs" and "lows". Map the distribution of these variables. Compare the resultant patterns with the aged population pattern, and formulate generalizations of their associations.

(4) In general, and dependent upon the specific independent variables selected, the students will discover that the highest proportions of the elderly will be found in counties that are sparsely populated, highly or exclusively rural, and undergoing depopulation. They will also note that the characteristics listed above do not apply to the highly industrialized and rapidly growing southeastern quarter of the state. Thus, the lowest proportions of the elderly are in the populous, rapidly growing, industrialized and suburbanized counties.

Alternate Examples

The location and distribution of the paper-board container industry in the United States. A step-by-step demonstration of problem-solving with respect to this topic is provided by:

Stafford, H.A., Jr. "Factors in the Location of the Paper-board Container Industry," Economic Geography, XXXVI (July, 1960), 260-266.

The historical perspective is readily introduced into the problem-solving framework by attempting to account for changes in the location and distribution of automobile assembly plants in the United States.

Suggested References

Alderfer, E.B., and Michl, H.E. Economics of American Industry. New York: McGraw-Hill, 1957. Provides general background material.

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Miller, E.W. A Geography of Manufacturing. New Jersey: Prentice-Hall, 1962, 357-364.

Rae, J.B. American Automobile Manufacturers: The First Forty Years, New York: Temple Press, 1959.

Study of Expansion Trends in the Automobile Industry with Special Reference to the Detroit Region. Detroit Metropolitan Area Regional Planning Commission, Oct., 1956.

PART III. CONCEPT OF LOCATION—THE DESCRIPTION OF LOCATION ON THE EARTH'S SURFACE

Geographical Science is concerned with the locations and distributions of natural and cultural phenomena on the surface of the earth. The key attribute of phenomena with which geographers are concerned is the attribute of location - where things are. The purpose of this section is to acquaint the student with the concepts and methods by which scholars locate things on earth.

Someone has said that the strength of any discipline is in large part determined by the sophistication of its measurement concepts. The basic concept of this brief section views locational description as an act of measurement; i.e., placing the occurrence of a phenomenon along a scale of values so that the attribute (location) being measured can be given precise meaning with respect to other occurrences and with respect to usable reference points. Attention will therefore be focused on systems of locational description on earth.

Developing the Concept of Location:

The concept of location and the measurement systems that have been devised to accomplish this will be developed by:

(1) Having the student locate phenomena on maps utilizing a variety of different location systems.
(2) Developing, on the basis of these exercises, the general characteristics, uses, and strengths of the several systems.
(3) Describing in some detail the nature of the widely used systems. These would include the earth's latitude-longitude system and a large scale x, y, coordinate system. It is not necessary to develop very fully the broad topic of map projections, although this can be done, if other considerations make it desirable.

Suggested Exercises:

1. On a blank outline map of the world containing latitude-longitude lines ask the student to locate a series of points as follows: (this may also be done on a globe or on a map of a smaller area)

Point A	92° 14' W	42° 38' N
Point B	14° 10' W	27° 11' S
Point C		
Point D	etc.	
Point E		
Point F	51° 10' 30" N	29° 9' 10" E

Class discussion should bring out the following points with regard to this location system:

a. The reference points (Equator, Prime Meridian)
b. The ordering principle
c. The degree of locational precision provided by the system (if you were told to meet someone at 51° 10' 30" N, 29° 9' 10" E, how close or far would you be from that person if you went to that location?)

2. On a county outline map of the U.S. ask the student to locate a series of points as follows: (Again other maps with political units may be employed.)

Point A	Dane, Wisconsin
Point B	Cedar, Iowa
Point C	San Bernadino, California
Point D	Clayton, Georgia
Point E	Herkimer, New York
Point F	Cass township, Cedar County, Iowa

Class discussion should again bring out:

1) The reference points - there are none
2) The ordering principle - there is none, except for that provided by the state designation
3) The degree of locational precision involved

3. On a street map of some city, ask the student to locate the following points:

Point A	915 S. Jefferson Street
Point B	10 E. Main
Point C	1429 3rd Avenue
Point D	2741 3rd Avenue
	etc.

a. The reference points in most American cities are established by certain EW and NS streets.
b. The ordering principles – most all cities have some order to the numbering system of houses and many employ some ordering principles in the naming of streets as well.
c. The degree of locational precision involved.

Lines of Advance:

Exercises of the type suggested above, (and many other examples that can be developed) should be used as the basis for a discussion of the basic categories and general characteristics of locational measurement systems.

Place Name or Nominal Systems

A. Examples: Hales Corner, Mt. Baldy, Cape May, etc.
B. Such systems lack reference points and they lack an ordering principle, but are much used in common parlance and may provide a high degree of precision, depending on the size of the feature employed in the name.
C. The absence of either a reference point or an ordering principle requires that the user of such a locational description know the position of any point with respect to another. This weakness renders such a specification relatively useless unless combined with another system and for this reason many would hesitate to call such specifications a system.

Co-ordinate Systems

A. Examples: Latitude and longitude, military grid, street numbers.

B. Systems of this type normally have reference points, ordering principles, and permit rather precise location if the several levels of the system are employed. If both the reference points, and the ordering principles are known, the user can locate any point with reference to any other point without recourse to any other information.

C. 1. The latitude-longitude system employs the Equator and the Prime Meridian as reference lines and uses sight angles from the earth's surface to some celestial body as the ordering principle. This provides 90° of latitude from the equator to the poles, etc. How far is 45° N, 10° W from 45° N, 20° W? What is the relative position of these two points?

2. In some cities the street numbering system is as complete as the earth's grid, such that knowing reference lines and ordering principles enables the user to position points with respect to other points. In Chicago for example, streets on the south side are numbered consecutively with 8 street numbers to the mile. Where is 900 W. 39th Street with respect to 900 W. 47th Street? In some cases the ordering principle is something else. For example, in some cities, streets are named for the presidents in the order that they were in office: Washington, Adams, etc.

Angle-Distance Systems

A. Examples: Gun crews locating a target, etc.

B. Angle-distance systems employ a reference point and a direction and distance from that point to locate things. If all of these elements are fully developed, then locational specification is quite good with a minimum of information.

C. We utilize this type of specification in common parlance, as for example, "I am stranded and out of gas 3-1/2 miles northeast of Jones Grocery Store." With the use of detailed angle and distance specification, a high degree of locational precision can be provided by such systems.

Unit Area Systems

A. Examples: Political Units, Zip Codes.

B. These systems are sometimes a little different from place name systems in that they lack reference points and order. However, because the order frequently is well known and in a few cases a crude order is present, these types of locational measurement are treated separately. Much economic and social data in Geography is located by these systems.

C. The U.S. system of states, counties, and townships provides locational accuracy down to the level of a unit 6 miles square (compare that with the accuracy of the latitude, longitude system), although this varies considerably in different sections of the country. An ordering principle is lacking in the names, but at least for the first level of the system (states) the location is generally known and usable.

C. The ZIP code system of the U.S. Post Office provides an interesting example of a unit area system with an ordering principle. Is area 95005 east or west of area 54201? Again hierarchies permit a fair degree of locational precision.

References and Readings:

Haggett, Peter. Locational Analysis in Human Geography. London: Edward Arnold, 1965, Chapter 8.

Robinson, A.H. Elements of Cartography. 2nd ed. New York: Wiley, 1960, Chapters 2,8,9.

PART IV. DISTRIBUTIONS AND SURFACES: THEIR NATURE AND GENERAL CHARACTERISTICS

To develop generalizations and scientific understandings on the basis of the location of a single occurrence, is scientifically unsound. Geographers must work, therefore, with distributions or "sets of locations", as for example, the distribution of cities over a million, the distribution of particular types of farms such as dairy farms or crop and livestock farms, or the distribution of specific temperatures at a given time. We shall see that all such spatial distributions have three characteristics which might be studied: areal extent, density, and pattern.

Continuous and Discrete Phenomena

As geographers examine the distribution of phenomena they encounter two fundamental types. The first may be defined as a spatial distribution in which occurrences of the phenomenon being studied occur at all points within a study area. In other words, there are no breaks or voids in their distribution. This type of distribution is commonly referred to as a continuous spatial distribution, or a surface. Barometric pressure, air temperature, and elevation above or below sea level are phenomenon which fulfill this requirement because at each and every point within a study area pressure, temperature, and elevation are present.

The second kind of basic distribution is the discrete spatial distribution. A discrete spatial distribution exists when occurrences of the phenomenon being studied are separated by areas of non-occurrence. Gravel pits, iron ore deposits, population, and snowfall exemplify phenomena which fulfill this requirement because they are phenomena found only at particular places on the surface of the earth at any particular time.

In practice many discrete distributions are treated as continuous distributions by modifying the length of time or the size of the unit areas for which the information about a specific phenomenon is being recorded. On the other hand, some continuous distributions may be observed and treated as though they are discrete. In any event, whether a particular phenomenon is treated as a discrete, or a continuous spatial distribution is largely a function of the goals of the investigation, the availability of data, and the costs associated with the study.

We frequently find it convenient to view both discrete and continuous distributions as surfaces—that is, as a smooth or undulating plane which passes through the values specified by the data. The earth's land forms present, in reality, such a surface. In similar fashion, a set of data describing the price of wheat at various locations may be conceptualized as a cost surface.

Ways of Representing Spatial Distributions and Surfaces

Spatial distributions and surfaces can be represented in a number of different ways. These various portrayals, it is true, alter the real surface in different ways, but in so doing make the description of the surface more usable, more manipulative, conserve space and effort, or highlight certain attributes deemed desirable by the investigator.

I. Map

Maps provide a convenient way of representing surfaces—as for example, maps employing dots, isopleths, isolines and hachures to mention a few. Exercises I, II, and III in this section are illustrative of several of the fore-mentioned map types.

II. Table

Surfaces can be represented by a table in which the locations and the associated atttibute of each location are listed. The table, however, has a noteworthy weakness in that it fails to portray the positional aspects of the spatial distribution involved.

III. Equation

A spatial distribution can also be represented by an equation. This is a procedure that translates data describing a spatial distribution into symbolic language. By way of example, consider the distribution of land values at four different locations progressing outward from the center of a city.

Location	Land Values Per Acre
A (city center)	\$5,000
B (1 mile out)	\$4,000
C (2 miles out)	\$3,000
D (3 miles out)	\$2,000
E (4 miles out)	\$1,000

The equation that represents this distribution is:

$$Z = 5{,}000 - 1{,}000x$$

where Z equals land value and x equals distance from city center.

Another example involves a distribution that varies in two directions. The map (next page) may be assumed to represent average wheat production in bushels per acre as it varies among nine unit areas of one square mile each.

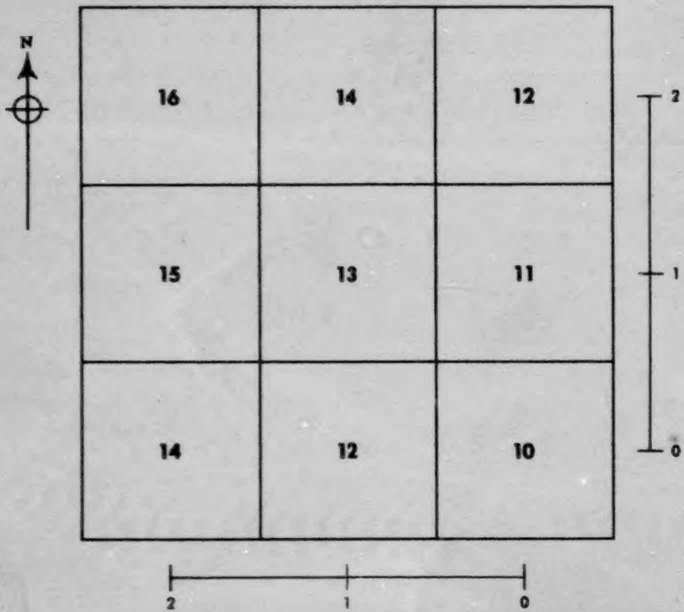
The equation that describes this variation might be:

$$Z = 10 + 2x + 1y$$

where Z equals wheat production in bushels per acre, x equals distance west of the assumed origin in the southeastern most unit area, and y equals distance north of this origin. Note, that in this example wheat yields are assumed to exist at the center of each unit area.

IV. Photograph

A spatial distribution or a surface can also be represented by a photograph. This means of portrayal is normally the most "real" of the several methods, but is not always usable for scientific purposes because the photograph of necessity must include phenomena that are not germain to the investigation. In essence, a photograph is likely to give too much detail. For this reason, things shown in photographs are usually translated into other forms of portrayal.



V. Landscape Painting

Similar to a photograph in terms of portraying a surface is the landscape painting or "sketch". In this case the eye and mind of the artist takes the place of the camera lense. As might be surmised, no two artists would likely portray the same surface in exactly the same way. However, unlike the photograph, the landscape painting may "filter out" unwanted detail and may succeed in usefully highlighting or generalizing the surface under consideration.

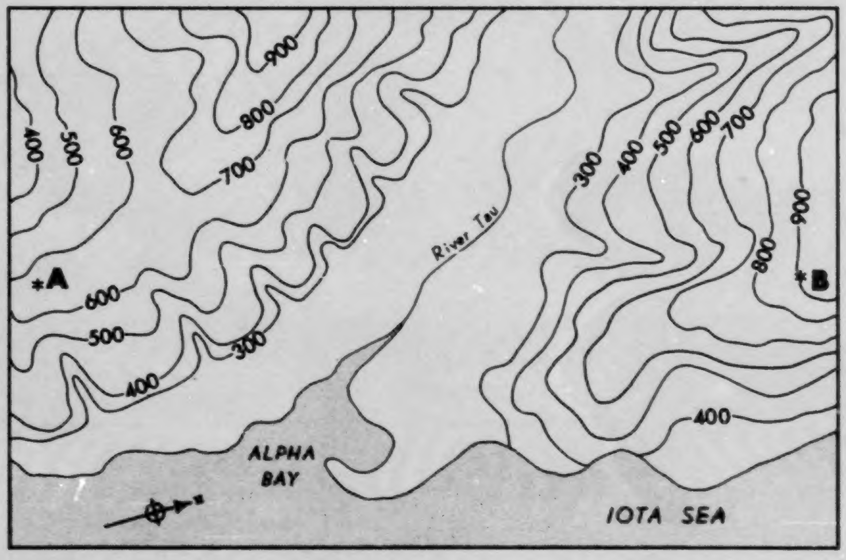
VI. Verbal Description

Many surfaces have been described verbally by setting forth the essential properties of the surface in words. For example, certain textbooks in geography contain excellent descriptions of population distribution in the United States, and some of the descriptions of landform surfaces of Western United States by early explorers have become classics.

VII. Physical Representation (Models)

Distributions and surfaces can also be portrayed by physical representations (models). In these cases the features of one surface are represented by an analogous object with similar features, as for example, three dimensional portrayals of the earth's land surface. Other illustrations include the use of sand piles to represent population density surfaces, or the use of the magnetic field to represent the "attractiveness surface" of a shopping center.

EXERCISE 1: USING A CONTOUR MAP


900
800
700
400
500
600
*A
600
500
400
300
River Tau
300
400
500
600
700
900
800
*B
400
ALPHA BAY
IOTA SEA
N

1. Shade lightly all land areas above 700 feet.

2. Put in the rivers. One system, consisting of a main stream and a tributary, leaves the map at A. The other consists of three separate streams flowing south to the River Tau.

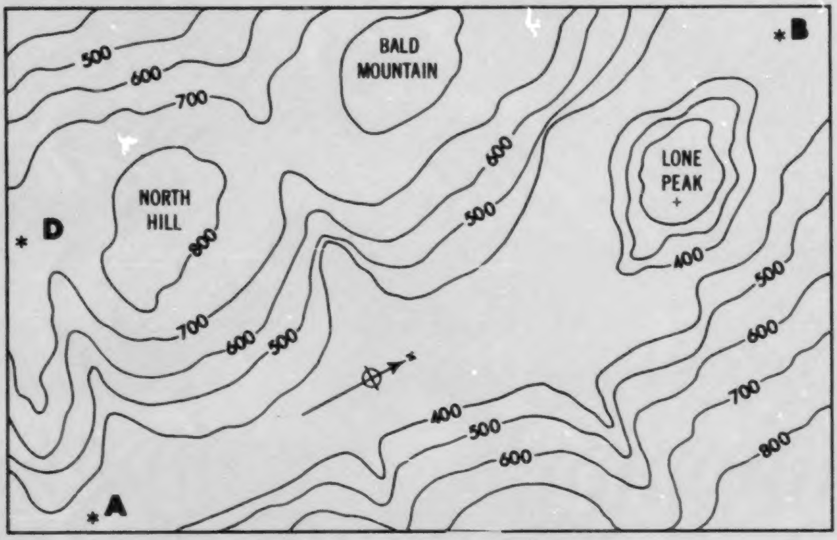
3. Construct a topographic profile A – B.
   Show by an arrow the position of the River Tau.

4. Write the word(s) CLIFF, MEANDER, BROAD RIVER VALLEY, HIGHEST POINT, CONFLUENCE, SAND BAR, SWIFT STREAM, over one example of each.

5. What direction is B from A, roughly?

6. Where would be the likely location of a large town? (Hint: this map shows an area between 40°N. and 50° N.). WHY?

EXERCISE II: AN ALTERNATE EXERCISE ON CONTOUR MAPPING


500
600
700
BALD MOUNTAIN
B
NORTH HILL
800
D
600
500
LONE PEAK
400
700
600
500
500
600
700
400
500
600
800
A

Horizontal Scale: 1 inch to 1 mile

Vertical Scale: 1/10 inch to 100 feet

1. Complete the numbering of the contours. Suggest possible values for the peaks.

2. Complete the river system, putting in all possible streams.

3. What is the gradient of the stream from A to B?

4. Draw the topographic profile B-D on graph paper.

5. Put a W where you would most likely find a waterfall.

6. If the prevailing winds are from the east, shade in the "rain shadow area." (Provide a "legend")

7. Write the words STEEP SLOPE, OUTLIER, PRECIPICE, NARROW VALLEY, over one example of each.

8. What direction is A from D?

9. Shade the area likely to be affected by orographic precipitation.

EXERCISE III: POPULATION DENSITY MAP

Suggested Lines of Advance:

1. Select some state and procure a liberal supply of county outline maps of that state.
2. Consult the Census to obtain the population for each county in the state.
3. Construct maps to depict the distribution of population using the following techniques:
    a. A dot map of absolute values.
    b. An isoline map of population density using per square mile values.
    c. A choropleth map of population density.
4. Compare and contrast the finished maps and discuss their specific utility.

References and Readings:

Robinson, A.H. Elements of Cartography. 2nd ed., New York: Wiley, 1960.
Monkhouse, F.J., and Wilkinson, H.R. Maps and Diagrams, Their Compilation and Construction. 2nd ed., London: Dutton, 1964.

Properties of Distributions and Surfaces

All spatial distributions whether they are conceived as discrete occurrences or as continuous surfaces have three properties which can be investigated. These properties are areal extent, density, and pattern. By areal extent geographers mean the area that is covered by the distribution being studied—the area in which manufacturing in the Soviet Far East occurs, or the areal extent of coal deposits in Belgium. To a large degree the areal extent of a distribution is defined by the investigator; that is, the areal limits of his interest and/or the extent of the distribution in the area he has chosen to study.

Density refers to the number of occurrences within a distribution per unit of area, as for example, the density of population per square mile in Alabama, or the density of milk cows per 1,000 hectares in central Chile. Density may be likened to frequency as that term is employed in statistical frequency distributions. Unit areas are the spatial equivalent of class intervals, and number of occurrences is the equivalent of frequency.

By pattern, geographers mean the arrangement of phenomena within a distribution or the configuration of the elements in the distribution expressed in terms of angles and relative distances. For example, the farm houses in rural areas may be arranged in a linear pattern, a circular pattern, a rectangular pattern or quite irregularly. For continuous distributions or surfaces it might be better to use the term topography rather than pattern. Topography is expressed in terms of the relative positions of highs and lows and the nature of the intervening slopes.

The topography of continuous distributions can also take many forms. Some examples are: surfaces that slope continuously in one direction as illustrated by wheat yields as one moves westward across the Great Plains (assuming wheat production to be a continuous phenomenon); unimodal surfaces as exemplified by population density decline outward from city centers; or bimodal, as expressed by the density surface of research and development expenditures with one peak in northeastern United States and a second peak in the Pacific coastal region, and so on.

Suggested Exercises to Accompany Properties of Distributions and Surfaces

EXERCISE IV. CALCULATING THE MEAN AREAL CENTER OF A DISTRIBUTION

Using those population data collected for Exercise III, calculate the mean areal center of that distribution following the method employed by Hart.

Hart, J.F. "Central Tendency in Areal Distributions," Economic Geography, XXX (January, 1954), 48-59.

EXERCISE V. DISPERSION OF POPULATION AROUND A MEAN CENTER

Again using those population data collected for Exercise III, calculate the dispersion of population around this mean center employing the procedures suggested by Bachi.

Bachi. R. "Standard Distance Measures and Related Methods for Spatial Analysis," Regional Science Association, Papers and Proceedings, X (1963), 83-132.

EXERCISE VI. NEAREST NEIGHBOR ANALYSIS

The specific exercise to accompany this lecture-demonstration of nearest neighbor analysis is left to the discretion of the instructor.

Suggested References: Nearest Neighbor Methods

Clark, P.J., and Evans, F.C. "Distance to Nearest Neighbor as a Measure of Spatial Relationships in Populations," Ecology, XXXV (October, 1954), 445-453.

Dacey, M.F. "The Spacing of River Towns," Annals of the Association of American Geographers, L (March, 1960), 59-61.

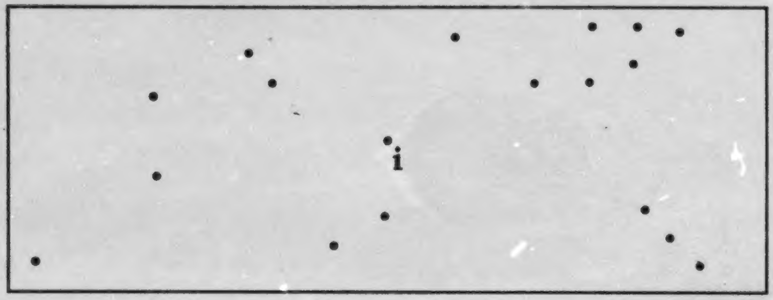
Greig-Smith, P. Quantitative Plant Ecology. 2nd ed. London: Butterworth's Scientific Publications, 1964.

Getis, A. "Temporal Land-Use Pattern Analysis with the Use of Nearest Neighbor and Quadrat Methods," Annals of the Association of American Geographers, LIV (December, 1959), 391-399.

For a more advanced treatment of nearest neighbor see: Dacey, M.F. "A Note on the Derivation of Nearest Neighbor Distances," Journal of Regional Science, II (1960), 81-87.

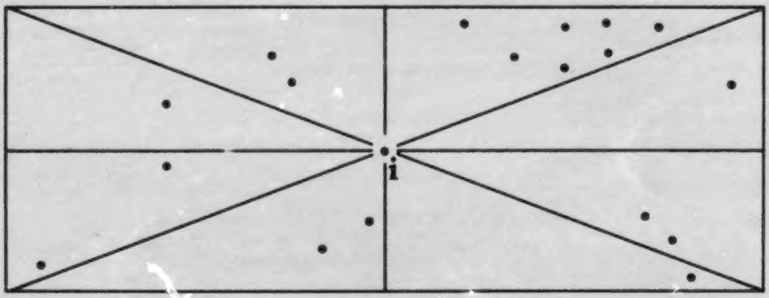
The Method

As a point of departure, consider a plain with a number of towns.



Choose one town, say town i; one method of describing the relationship between i and the other towns is to arrange the other towns in order of their distance from i. The closest town to i is called the first nearest neighbor to town i. Similarly, the 2nd, 3rd, 4th, 5th .... nth nearest towns are the 2nd, 3rd, 4th, 5th .... nth nearest neighbor of i.

A variation that has been suggested is to divide the plain around i into regions or sectors. The towns falling into the sectors surrounding i are called "regional near neighbors".



The pattern (relationships between members of the distribution) is considered to lie between two extremes:

1. Maximum clustering - where all the members are at one point.
2. Absolute regularity - where the members are spaced in a "regular" manner. Here inter-member distance is at a maximum. In this case the members are distributed so as to form a "hexagonal lattice", with each member equidistant from five others.

A "random distribution" lies between these limits:

1. Rank the neighbors according to their distance from the chosen central point. Denote the distance to the first nearest neighbor by d_1, that to the second by d_2, and so on to d_n.

2. The "mean observed distance" is

$$\bar{d}_A = \sum d/_n$$

where n is the number of towns on the plain.

3. It is possible to compute certain theoretical values of d and then compare the value $\bar{d}_A$ with them.

4. Where there is "maximum clustering" the value $\bar{d}_A = 0$.
In the "hexagonal lattice" case the value of $\bar{d}_A$ has been found to be:

$$\bar{d}_A = 1.0746_p{}^{-\frac{1}{2}}$$

where p is the density of the distribution.

Thus $\bar{d}$ has the following range:

$$0 \text{ to } 1.0746_p{}^{-\frac{1}{2}}$$

It has also been found that if the distribution is "random"

$$\bar{d}_A = .5_p{}^{-\frac{1}{2}}$$

Using these 'norms' we can test whether a given $\bar{d}_A$ value departs significantly from a hypothetical value of $\bar{d}$ (represented below by $\bar{d}_H$). Therefore the difference between the observed $\bar{d}_A$ and given $\bar{d}_H$ can be tested statistically by using the standard error of the mean of the observed nearest neighbor distances, using:

$$Z = \frac{\bar{d}_H - d_A}{S_{\bar{d}_A}}$$

where $S\bar{d}_A$ = standard error of the mean distance

$\bar{d}_H$ = hypothetical value of $\bar{d}$

$\bar{d}_A$ = observed value.

Using these ideas it is a comparatively easy matter to construct class exercises to test how a distribution (say a distribution of towns) departs from "regularity".

Sampling[5]

The need for sampling in Geography arises from the impossibility of obtaining observations from every conceivable location. Observations are made or taken at locations picked in some objective fashion (some "sampling plan"), and generalizations made from this sample. As a classroom illustration consider the construction and delimitations of climatic regions from data gathered at selected stations.

Object of Sampling

A sample consists of a small collection from some larger aggregate about which we wish information. The sample is examined and the facts about it learned. Based on these facts, the problem is to make correct inferences about the phenomenon within an area. In essence, measurements or observations are made on the location of a limited number of individuals or objects in order that generalizations or inferences may be drawn about the larger area from which these samples have been drawn.

Some advantages of sampling:

1. Speed (and hence greater utility of the data). Faster gathering of information.
2. Low cost (if being carried out for a "practical" purpose).
3. Population (in statistical sense) may be scattered as to be inaccessible as a whole.
4. Some sampling plans make it possible to measure the reliability of the sample estimates from the sample itself.

Limitations of sampling:

1. Cannot be used if information about each individual unit is needed. Does not give information about every individual unit.
2. Occasionally sampling error may be larger than expected.

Twin problems facing the investigator using sampling:

1. He must design and conduct his sampling in such a way that it is representative of the entire surface of the study area.
2. Having studied the sample, he must attempt to make correct inferences about the surface of the study area.

Inferences obtained from the sample differ from facts about the surface of the study area because:

1. Attributes of location differ, and

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[5] Preliminary Notations:

(1) Each individual will require a Random Numbers Table. Suggested: Herbert Arkin and Raymond R. Colton. Tables for Statisticians. (College Outline Series), 2nd ed., Barnes and Noble, 1965.

(2) Develop an exercise that stresses the use of Random Numbers Tables. The purpose of this exercise is to familiarize students with the mechanics of using the tables. Explain a few of the ways the tables can be used—down columns, across rows, diagonally, etc. A class assignment should be devised wherein a random sample is drawn from some population using these tables.

(3) Be prepared to explain and compute the Mean and Standard Deviation of a set of numerical observations. These computations are needed for certain exercises. Reference: Paul Blommers and E.F. Lindquist, Elementary Statistical Methods. Boston: Houghton Mifflin and Company, 1960. (Or any text on elementary statistics.)

2. Chance or uncontrolled influences play a part in determining which of these differing locations are to be in the sample, and out of the sample. Because of the human element involved, bias needs to be eliminated. This can be accomplished by random selection or by random assignment.

Why random selection? To eliminate bias, sampling cannot be left to the judgment of the sampler because the probability of his selection is unknown.

Devices to attain randomness:

1. Thoroughly mix the population itself.
2. Choice of sample may be left to some mechanical process.

By what mechanical procedures are random samples selected?

Mechanical devices:

1. Shuffled deck of cards
2. Numbers from a hat
3. Numbered balls as in bingo
4. Random number tables

Five Elements of a Sampling Plan:

1. The frame
2. The procedure for drawing the sample from the frame
3. The formula by which to compute from the returns of the sample an estimate of the numerical value that the equal complete coverage of the whole frame would give for some statistical characteristic of the frame.
4. The formula for calculating the standard error of any estimate; also the bias of any estimate.
5. A control to evaluate the non-sampling errors and their possible effects on the final estimate.

The Frame:

The means of access to the universe. A frame is made up of sampling units—dwellings, farms, industrial or agricultural products, etc.

A sample of all the sampling units in the frame is by definition a complete coverage of the frame (a 100% sample).

Census tracts
City directory
City blocks
List of members of the AAG
List of license plates
List of telephone numbers

Every sampling unit in a frame will bear a serial number in order to use the random number tables.

Basic types of probability sampling:

$$\left.\begin{array}{l}\text{random}\\ \text{systematic}\\ \text{stratified}\\ \text{cluster}\end{array}\right\}\ \text{sampling}$$

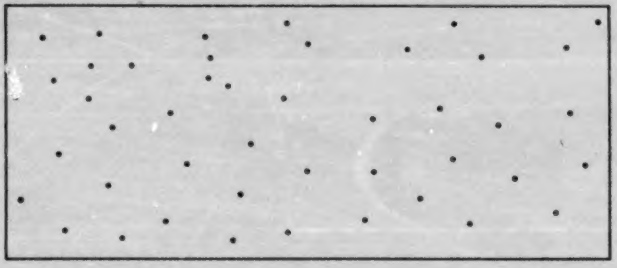
What is a probability sample?

Distinguishing characteristic: every individual must have a known probability of being included in the sample. In making statistical inferences, probabilities must be known in order to arrive at a "weighting" procedure of some kind.

Sample Designs:

(Strategy: to choose the type appropriate to a given situation.)

Random sample – taken by some semblance of mechanical (dice, coins, random numbers) randomizing process.



Multi-stage sampling (example)

1st. simple random sample of census tracts within the city

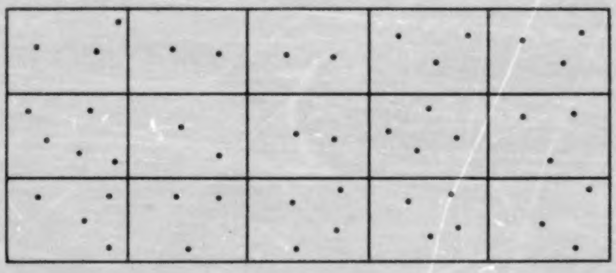
2nd. within each tract, take a simple random sample of blocks

3rd. select every 5th house, say, within these blocks

4th. interview every second adult in each of these houses

Stratified sampling:

First we divide the individuals into groups or categories, and then select independent samples within each group or stratum. (Take a simple random sample or systematic sample in each group.)



Systematic sampling:

Instead of using random tables here we simply go down a list choosing every kth individual, starting with a randomly selected case. Use for long lists or large samples.

Cluster sampling:

Stratified—divide population into groups which we called strata and sample from every stratum.

Cluster—divide population into a large number of groups called clusters, and sample among the clusters. For example, we might divide a city into several hundred census tracts and then select 40 tracts for our sample. Thus we do not sample our elements directly, but sample clusters or groups of elements.

Note on Sampling without replacement:

On each successive draw the probability of an individual's being selected is slightly increased because of the fact that there will be fewer and fewer individuals left unselected from the population.

The sampling fractions for each stratum may be equal in which case we have a proportional stratified sample, or we may have a disproportional stratified sample.

Proportional stratified sampling:
To assure a more representative sample than might be expected under random or systematic sampling.

Suppose we had:

600 Protestants
300 Catholics
100 Jews

in a population

If a random sample of 100 were drawn we would not get exactly 60 Protestants, 30 Catholics, 10 Jews. The proportion of Jews might be relatively either too large or too small.

A proportional stratified sample in which the sampling fractions for all three strata were 1/10 (60 Protestants, 30 Catholics, 10 Jews = 100) would yield more reliable results than a simple random sample.

Factors determining relative efficiency of the cluster design:
The degree of homogeneity within the clusters and the size of the cluster itself. We want homogeneous clusters to be small; if they are heterogeneous we can afford to take more cases within each cluster without seriously impairing the efficiency.

Comparison: Single Stage Cluster, Simple Random, Stratified

Single Stage Cluster: groups clusters randomly selected first and then every individual within the sampled clusters is used in the total sample. Errors: variability between clusters

vs.

Stratified sampling: sample individuals within every stratum. Every stratum is therefore represented by a certain number of cases. Errors: variability within strata

Single stage cluster: less efficient (i.e., will yield greater sampling errors) than simple random samples of the same size.

vs.

Simple random: but cluster sampling costs less

Single stage cluster design: use random selection among clusters, and then select every individual within those clusters included in the sample of clusters.

SUGGESTED EXERCISES, ASSIGNMENT AND DATA SOURCES

1. Let each person draw a number of random samples from a population.
2. Let him compute the mean and the standard deviation of each sample.
3. Let him find the standard error of the following sampling distributions:

   Mean

   Standard deviation

4. Compare these computations for the whole class, and observe similarities and differences.

Computation for standard error of the sampling distribution of the means:

Use Formula:

$$S.E._m = S.D./\sqrt{N} \quad \text{or} \quad \sigma_{\bar{X}} = \sigma/\sqrt{N}$$

Computation for standard error of the sampling distribution of the standard deviation:

Use formula:

$$S.E._{S.D.} = S.D./\sqrt{2N}$$

or

$$\sigma_S = \sigma/\sqrt{2N}$$

Areal Sampling from Maps:

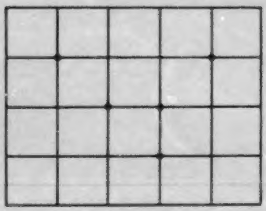
Suppose that a study is being made of farming over a large area and an assessment is required of the average size of farm holdings. The total number of farms is so large that it is decided to study only a sample of these farms.

Areal sampling by random numbers requires that the area be "gridded".

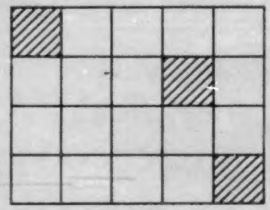
5	16	25	•	•	•	•
4	15	24	•	•	•	•
3	14	23	•	•	•	•
2	13	22	26	•	•	•
1	12	17	18	19	20	21
0	6	7	8	9	10	11

Numbers can refer to grid intersections or to small squares.

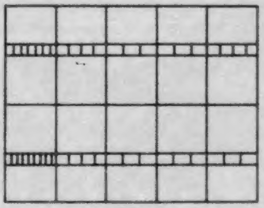
Methods for areal distributions



Point Sampling



Area Sampling



Line Sampling

Each student can draw 2 random samples. Compute the standard error of the difference between sample means; the class results can be compared for similarity.

(1) Let each student draw a random sample from some pupulation—say temperature figures for some specified period (assuming that these figures constitute a "population").
(2) Let him then compute the mean of the sample values.
(3) Let him compute the standard error of the difference between means.

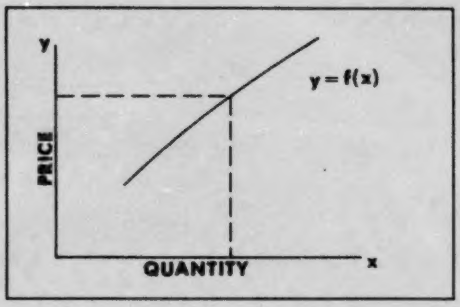
Step by step Standard Error of Difference between means:

(1) Find S.E. of each mean using $S.E_m = S.D./\sqrt{N}$
(2) Square each of the Standard Errors in (1)
(3) Find the sum of the squares of the two S.E.'s.
(4) Double the correlation co-efficient
(5) Find product of the two S.E.'s.
(6) Multiply (4) by (5)
(7) Subtract the number in (6) from the number in (3)
(8) Find the square root of the result—this is the S.E. of the Difference. (If a random numbers table is used some planning is necessary to avoid two persons using the table in quite the same way.)

PART V. TYPES OF SURFACES AND DISTRIBUTIONS[6]

It should have become clear to the student that quite a variety of phenomena which have geographical expression (in the sense of being distributed over the earth's surface) can be viewed as distributions or surfaces, such as the earth's land envelope. Others are directly measurable but not visible to the observer, such as a barometric pressure surface or land value surface. Still others are abstract surfaces in the sense that they are the result of some manipulation of data, as exemplified by an isochronic surface. The section that follows provides some examples of the different kinds of surfaces that have been employed in geography. (See next page)

Go on to a more 'abstract' example—-the total product surface in Economics.



The supply curve—here a function of 2 variables. Upward sloping to the right, since a higher price will encourage sellers to place more of the goods on the market.

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[6] Preliminary Notes:

It is suggested, that in developing the concept of surfaces, numerous maps and diagrams covering a wide range of socio-economic phenomena be introduced. Such illustrations should not only portray phenomena in terms of conventional densities but should also be based on such things as "potential", iso-cost, iso-chrones, and so on. As Warntz has said, "...these conceptual surfaces may be regarded as overlying the surface of the real earth and the geometric and topological characteristics of these surfaces as transformed, thus describe aspects of the geography of the real world."

Stewart's "Sand Pile Citizen" is an excellent illustration of a surface. John Q. Stewart introduced the analogy of the "Sand Pile Citizen"—quoted by Warntz.

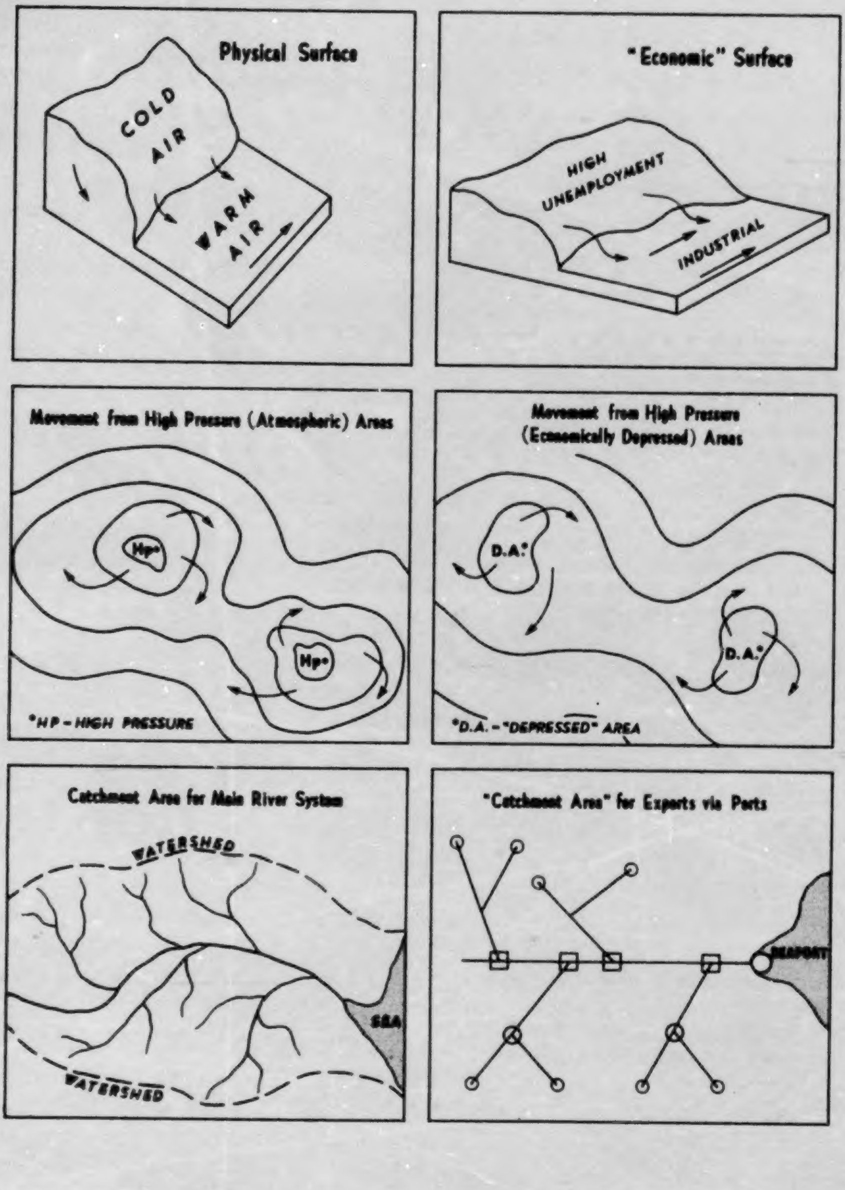
References:

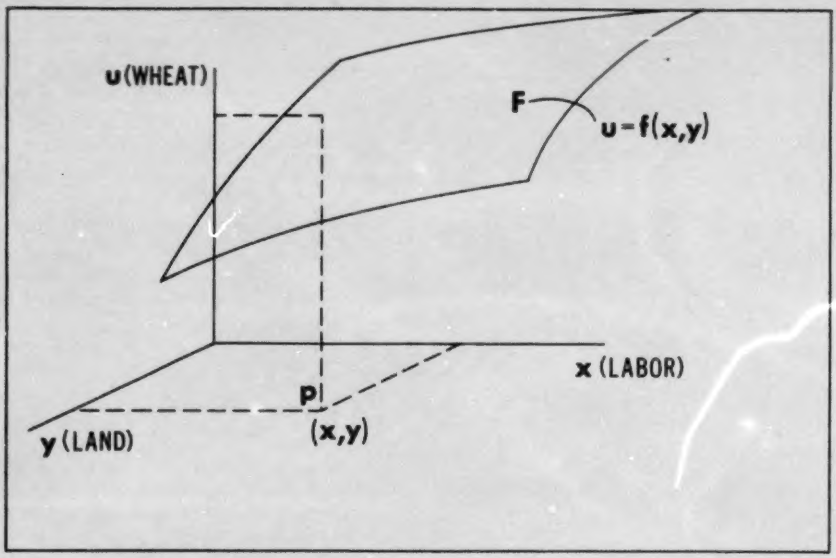
Stewart, John Q. Coasts, Waves and Weather for Navigators. Boston: Ginn and Co., 1945.

Warntz, William. "A New Map of the Surface of Population Potential for the United States, 1960," Geographical Review, LIV (April, 1964), 170-184.

Instead of depicting population by dots or as densities over areas, let us imagine that each person is surrounded by a sandpile built up to some arbitrary height. Let the height of the sand decrease proportionally as distance from our citizen increases. If this is done for each person the three dimensional model so obtained can be said to represent the "surface" of that population potential.

ILLUSTRATION OF SURFACE "TYPES"


Physical Surface
COLD AIR
WARM AIR
"Economic" Surface
HIGH UNEMPLOYMENT
INDUSTRIAL
Movement from High Pressure (Atmospheric) Areas
Hp*
Hp*
*HP - HIGH PRESSURE
Movement from High Pressure (Economically Depressed) Areas
D.A.*
D.A.*
*D.A. - "DEPRESSED" AREA
Catchment Area for Main River System
WATERSHED
SEA
WATERSHED
"Catchment Area" for Exports via Ports
SEAPORT



The total product surface—a function of 3 variables. The various ordered pairs of x and y on the x-y plane show the various combinations of labor and land. If p is a point on this plane, then the u=(x,y) surface maps this point into the u-axis and shows how much wheat will be produced by this combination of x and y. The total product surface is found by choosing (in theory) an infinite number of P's.

Examples (continued) "INCOME FRONTS"

Reference:

Warntz, William. Macrogeography and Income Fronts. Regional Science Research Institute, Monograph Series No. 3, 1965.

Atmospheric Pressure Surfaces

Any book on climatology or physical geography, for example: Strahler, Arthur N. Introduction to Physical Geography. New York: John Wiley and Sons, Inc., 1965.

The Monsoon

Stress both the traditional view—differential heating of sea and land surfaces—and the jet stream hypothesis.

Reference:

Delaborde, Pierre. The Monsoon. Translated by M.J. Clegg. London: Methuen, 1963.

EXAMPLES (Continued): DENSITY-DECLINE SURFACES

Basic Theory of Urban Land Use:
Sites within cities offer
(1) Land
(2) Accessibility

Each urban activity derives utility from a site in accordance with the site's location. The activity that can offer the highest bid for that site will occupy it. The most desirable aspect of urban sites is maximum accessibility, since transport arteries converge at the center. The least central ("accessible"), the location the greater the transport inputs incurred. Bid rent functions therefore decline with increasing distance from city center, land prices diminish outward and residential densities decline.

For Western cities, the poorer people tend to live near the center on expensive land (utilizing it intensively by multi-family dwellings), while the rich live at the periphery consuming much land. Since land consumed per person increases with distance from city center, population densities must decline.

Muth:
"the price per unit of housing, rent per unit of land, and output per unit of land - all DECLINE with distance. . . . . "
The per capita consumption of housing increases with distance from the market.

Gross population density also DECLINES with distance from market.

Associated with each point surrounding the market is some transport cost for consumers locating there.

Transport costs increase at a decreasing rate with distance from market.

For each consumer at his optimal location the saving in housing costs from a small change in distance must exactly equal the change in transport costs.

If transport costs fall, moving becomes a "paying" proposition, for a move unit distance farther from the market would exceed increase in transport.

Rent per unit of land must fall with distance from market (Demand per unit of housing is greater at the center).

With increasing distance firms substitute land for non-land factors (accessibility to CBD vs. spacious house lots).

Pivotal questions, Interest Factors, Illustrations

1. What part does race play in the density-decline of land values in American cities?
2. The slum and urban renewal
3. The centrifugal and centripetal forces of agglomeration
4. What factors determine the intensity of land use in urban areas?
5. Why do some cities spread out more than others?

Readings and References

Alonso, William. "A Theory of the Urban Land Market," *Papers and Proceedings of the Regional Science Association*, VI (1960), 149-157.

_________. "On Urban Rent Theory," *Papers and Proceedings of the Regional Science Association*, XIII (1958).

Berry, Brian J.L. "Urban Population Densities," *Geographical Review*, LIII (July, 1963), 389-405.

Blumenfield, Hans. "The Tidal Wave of Metropolitan Expansion," *Journal of the American Institute of Planners*, (Winter, 1959).

Carroll, J. Douglas Jr. "Spatial Interaction and the Urban-Metropolitan Regional Description," *Papers and Proceedings of the Regional Science Association*, I (1955), D2-D14.

Clark, Colin. "Urban Population Densities," *Journal of the Royal Statistical Society*, Series A CXIV (Part IV, 1951), 490-496.

Deutsch, Karl W., and Isard, W. "A Note on a Generalized Concept of Effective Distance," *Behavioral Science*, VI (October, 1961), 308-311.

Eaton, Gor~~don P.~~ "Windborne Volcanic Ash: A Possible Index to Polar Wandering," *Journal of Geology*, LXXII (January, 1964), 1-35.

Hoover, E.M. *The Location of Economic Activity*. New York: McGraw-Hill, 1963.

Marble, Duane. "Transport Inputs at Urban Residential Sites," *Papers and Proceedings of the Regional Science Association*, V (1959), 253-266.

Muth, Richard F. "The Spatial Structure of the Housing Market," *Papers and Proceedings of the Regional Science Association*, VII (1961), 207-220.

Niedercorn, John H., and Hearle, Edward F.L. "Land Use Trends in Large American Cities," *Land Economics*, XL (February, 1964).

Stewart, John Q., and Warntz, William. "Physics of Population Distribution," *Journal of Regional Science*, I (1958), 99-123.

Wingo, Lowdon. "An Economic Model of the Utilization of Urban Land for Residential Purposes," *Papers and Proceedings of the Regional Science Association*, VII (1961), 191-205.

SUGGESTED EXERCISES AND ASSIGNMENTS. DATA SOURCES
On Density-decline: Urban Population.

Equipment Needed:

1. Graph paper.
2. Tables of Natural Logarithms. See Arkin and Colton - *op. cit*. (see that each member of the class is familiar with the use of these tables)

Lines of Advance:

This type of exercise calls for some preparation in the method of data collection. It is suggested that each member of the class collect the data for his assigned area.

The city has to be chosen in advance (Chicago is suggested), and the sectors and blocks assigned.

Data and maps: U.S. Census of Housing (1960) City Blocks. Data are provided on a limited number of characteristics, but for our purposes

(a) block size (or census tract size)
(b) total dwelling units
(c) total population by block

are relevant.

The data collected by the class can be used for other exercises, e.g., choropleth, isoline maps.

EXERCISE:
Having assigned one or two sectors to each member of the class (the boundaries of the sector adjusted to include whole blocks) the density per block
  or density per census tract (delimited on the maps accompanying the census)
  or density per dwelling unit
is computed and recorded in the sector. This information is then transferred to graph paper, either arithmetic and/or logarithm.

Results can be compared. Departures from the expected negative-exponential curve can be discussed, and reasons advanced. For example:
(a) presence of racially segregated neighborhoods.
(b) group quarters, institutions
(c) abandoned houses

Slope of Regression Line

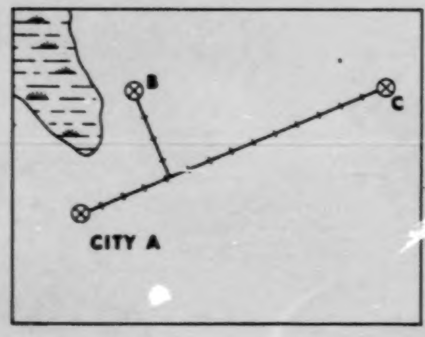
References

Baggaley, A. Intermediate Correlational Methods. New York: Wiley, 1964.
Blalock, H.M. Social Statistics. New York: McGraw-Hill, 1960, 276-278.

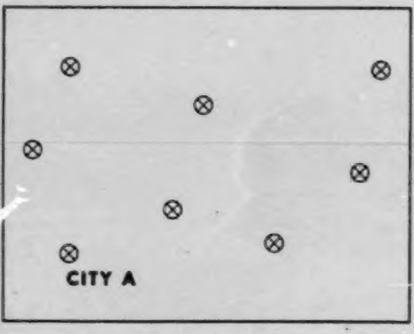
EXAMPLES (Continued): ISOCHRONIC SURFACES

Isochronic Maps and Distortion

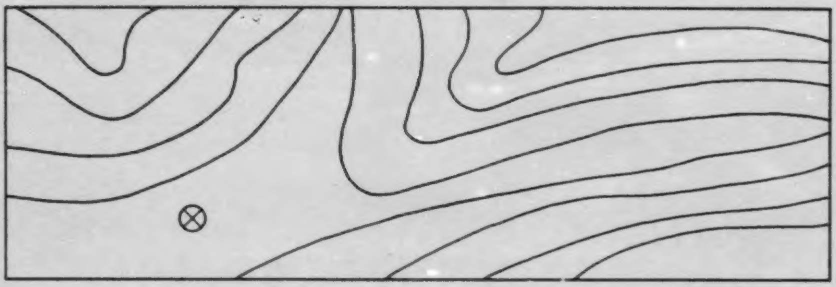
Use the notion of equal accessibility (on a travel time basis) to show that distance/space is not absolute in many areas of research. Ten miles to the north have not always the same value as ten miles to the south.
Example:



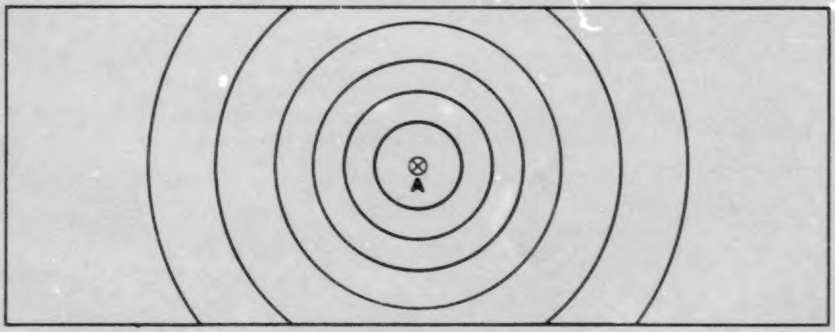
It may take a shorter time to get from A to C (direct rail connection) than from A to B, (a change of trains needed) despite the fact that B is nearer A than is C.



If travel times from A to all other places are available a travel-time surface or ISOCHRONIC map can be constructed.



Distances become "transformed."



Ideal surfaces map of isochrones—Concentric circles. Departure from this pattern will be called "distortions."

SUGGESTED EXERCISES AND ASSIGNMENTS. DATA SOURCES

The following is slightly modified from an exercise made by John C. Hudson, Department of Geography, University of North Dakota.

Although we usually think of distances between places on the earth as straight-line distances, or highway miles or in similar terms, distance as perceived by man (as well as animals) is often translated into some other terms such as the effort, cost or time involved in traveling to various places.

One major factor that distorts these pure-distance relationships is the existence of transportation routes. The accessibility of places is often determined by their location on transportation routes. Our conception of where the Soviet Union "was" in relation to the United States was greatly changed when air travel made the trans-polar route feasible. It suddenly appeared to be much closer, although, of course, locations were the same as before.

Lines connecting points of equal travel time from a particular location are termed isochrones, (isos meaning equal and chronos meaning time). The following data will enable you to construct an isochronic map of railroad travel time for Des Moines.

On a base map of Iowa locate the towns (by dots) listed below. County boundaries are not needed.

Near each dot place the travel time value. Construct isochrones for 1 hour, 2 hours, 3 hours, 4 hours, etc.

On a separate sheet of paper comment upon:
- (a) the distortions produced
- (b) the efficacy of isochronic maps to convey the "surfaces" idea

Data Source: Official Guide to Railways, December, 1955.

Railroad Travel Time from Des Moines, Iowa - 1955

From Des Moines to:	Hours : Minutes	From Des Moines to:	Hours : Minutes
Cedar Rapids	3:40	Mt. Ayr	2:52
Nevada	1:10	Chariton	1:40
Mason City	1:55	Oskaloosa	8:35
Marshalltown	1:55	Washington	5:50
Clinton	8:30	Muscatine	5:00
Iowa City	2:00	Shenandoah	8:20
Council Bluffs	2:15	Emmetsburg	9:35
Davenport	2:50	Knoxville	2:15
Ft. Dodge	2:50	Iowa Falls	2:25
Marion	3:29	Storm Lake	9:20
Sioux City	5:09	Charles City	10:16
Waterloo	3:40	Perry	0:55
Oelwein	4:20	Atlantic	1:33
Dubuque	10:00	Sheldon	11:35
Burlington	7:10	Keokuk	10:37
Albia	2:00	Carroll	8:00

References:

Blome, Donald. "A Map Transformation: Time - Distance Relationships in the Lansing Tri-County Area," Ekistics, XVII (1964), 104-106.
Bunge, William. Theoretical Geography. Seattle: University of Washington Press, 1960.

The works of Waldo Tobler, including his Ph.D. dissertation, are very relevant to any discussion of "distortion and distributions."

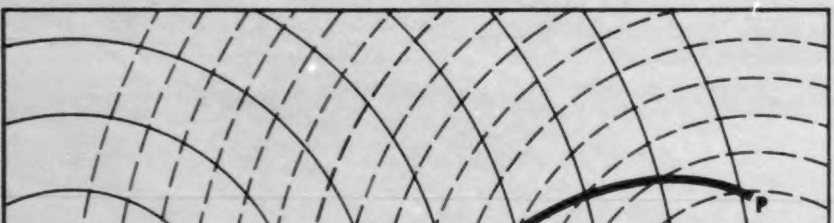
EXAMPLES (Continued): ISO-COST SURFACES

Perhaps one of the better examples from the literature to illustrate the concept of surfaces. Not only does it show how "surfaces" can touch and/or intersect, but it incorporates additional lines of advance for further discussion of Location Theory.

The original idea is contained in Weber, but has been discussed and refined in:

Daggett, Stuart. Principles of Inland Transportation. New York: Harper, 1955.
Greenhut, Melvin L. Plant Location in Theory and Practice. Chapel Hill: University of North Carolina Press, 1956, Chapter 1.
Isard, Walter. Location and Space Economy. New York: Wiley, 1956.

USE OF ISO-COST LINES TO PORTRAY A SURFACE



*M = source of raw material *P = point of production

*N = point of consumption

*Circles around C measure the cost of shipping a single unit of the finished product.

*It is assumed that the necessary raw material weighs twice as much as the finished products, hence circles around M are closer together.

Iso-Cost Surfaces

References:

Daggett, Stuart. Principles of Inland Transportation. New York: Harper and Brothers, 1955.

Hoover, Edgar M. The Location of Economic Activity. New York: McGraw-Hill, 1963.

Losch, August. The Economics of Location. Translated by W.H. Woglom. New Haven, Connecticut: Yale University Press, 1954.

Weber, Alfred. Theory of Location of Industries. Translated by Carl J. Friedrich. Chicago: University of Chicago Press, 1962.

PART VI. THE SPATIAL FACTOR IN INTERACTION

This is a vast topic, one which pervades all aspects of distributions in which geographers are interested. As Olsson has said "... practically all explanations of spatial distributions—no matter whether they have been formulated as general theories or not—have at least partly stressed an interaction element...." (page 1)

There has to be much planning and selection of examples to bring home the salient points. The following provide good background material:

Olsson, Gunnar. Distance and Human Interaction. Regional Science Research Institute Bibliography Series, No. 2, 1965.
Philbrick, Allen K. This Human World. New York: Wiley, 1963.
Vernon, Glenn M. Human Interaction. New York: The Ronald Press, 1965.

A suggested tactic is to choose one or two examples, and use these as vehicles to traverse the flow diagram attached (page 150).

After a short discussion on the meaning of 'interaction' the class should be asked to consider:

(1) Why is there interaction?
(2) What factors influence interaction?
(3) What are the strands of human interaction?

This can perhaps be given as a written exercise. It would serve the purpose of:

(1) Getting the student to think
(2) Giving the instructor an idea where to start in on this very broad topic.

The discussion can first center around the individual - what he does, how he acts depends partly upon what others do, how others act and progress to other scales - what the people in one section of the city do partly depends on what others in other parts do; how one town develops depends partly on how surrounding towns develop (or do not develop). Interaction follows from differences between/among people, between/among places.

(Some mention could also be made of the Concept of Areal Differentiation. See the work of Hartshorn, and G. de Jong's Chorological Differentiation, Groningen: J.B. Wolters, 1962)

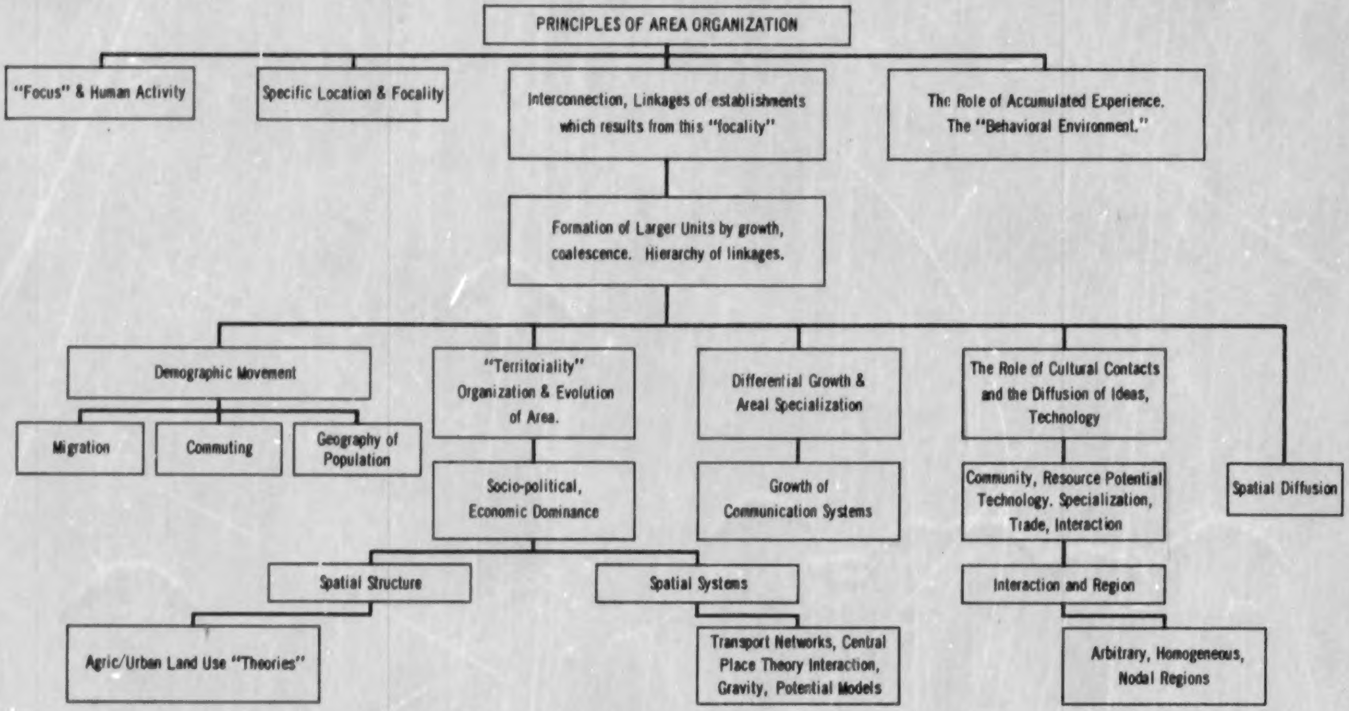
Stress that interaction implies/results in movement of goods, ideas, people...

Using the argument by analogy, ideas from "physical geography" can be utilized as illustrations:

Location - Insolation - Land/Water masses - Air Movements - Climate - Crops - ....is a suggestion.

The water cycle is another. Even the Monsoon discussed in the Unit on "surfaces" may be a useful illustration.

THE SPATIAL FACTOR IN INTERACTION


PRINCIPLES OF AREA ORGANIZATION
"Focus" & Human Activity
Specific Location & Focality
Interconnection, Linkages of establishments which results from this "focality"
The Role of Accumulated Experience. The "Behavioral Environment."
Formation of Larger Units by growth, coalescence. Hierarchy of linkages.
Demographic Movement
Migration
Commuting
Geography of Population
"Territoriality" Organization & Evolution of Area.
Socio-political, Economic Dominance
Differential Growth & Areal Specialization
Growth of Communication Systems
The Role of Cultural Contacts and the Diffusion of Ideas, Technology
Community, Resource Potential Technology. Specialization, Trade, Interaction
Spatial Diffusion
Spatial Structure
Agric/Urban Land Use "Theories"
Spatial Systems
Transport Networks, Central Place Theory Interaction, Gravity, Potential Models
Interaction and Region
Arbitrary, Homogeneous, Nodal Regions

STRANDS OF HUMAN INTERACTION:

- Transportation Networks.
- Gross movement of mail/telephone calls, etc.
- Flow of funds
- Migrations

It was suggested that a focus of human activity be taken and the resulting interaction traced through the flow diagram in this unit. Mining suggests itself as a useful vehicle, because data exist, the effects on the landscape are easily discernible, the distribution of mining activity is "discrete" ..... During the normal course of this activity establishments are interconnected (e.g., connection between mills and mines), and these interconnections result in the growth of larger units of area organization -- transportation networks, movement of workers, provision of power supplies, flow of foodstuffs and funds, interconnection with other raw materials to form an "industrial complex" ....

Another good example is the growth and spread of the plantation system. This offers an opportunity to show how greatly separated areas were interconnected by the system during the height of the sugar plantation.

SEE CHART ON THE SPATIAL FACTOR IN INTERACTION (page 150)

If the focus of activity is well chosen - and the extractive industries are suggested - examples from the "regional" section of parallel or continuing courses can be utilized advantageously. For example, if there is a parallel course on Scandinavia, the softwood industries from that area can be used.

An excellent and well written source on Scandinavia is:

Mead, W.R. An Economic Geography of the Scandinavian States and Finland.
London: University of London Press, Ltd., 1958.

The following is based on his examination of the Softwood Industries of that area (pages 233-255).

Stress first the reason for the "focus" - the use of softwoods. "Specifying location" provides an opportunity for Latitude/Longitude review, stressing the effects of the land/water distribution in Scandinavia.

Proceeding to the other "box" in the flow chart - interconnection and linkages - the role of the rivers, the river regimes, and the length of the 'freeze' can be stressed. Mead's use of floatage and felling cartograms (page 237) provides a good vehicle for the discussion of interconnections resulting from the "focus" of human activity - the softwood forests.

The hierarchy of units can be demonstrated by the links with the mills, hydroelectric power stations, paper distribution points, etc.

Demographic movement results from the seasonal demands of the industry; the financial and other requirements leads to certain territorial organization by each company, and so on through the flow chart.

The aim in using the chart and a well-chosen example is to demonstrate an ordered way of thinking, of seeing relationships, of bringing home the role of the spatial factor in interaction.

Very often material is not available, thus one example cannot be used to trace the steps through the chart. In this case, a different strategy can be adopted: take one example down to the appropriate level, then use another to stress the lower levels. Finally one could seek some cross-relationship between the examples.

This scheme may be necessary when talking about:
Agricultural/Urban Land Use "Theories"
Transportation and Other Networks
Arbitrary, Homogeneous and Nodal Regions
Spatial Diffusion

Agriculture/Urban Land Use Notions

An accessible source for background material is:

Hoover, E.M. The Location of Economic Activity. New York: McGraw-Hill, 1963, especially Chapter 6 "Land Use Competition"

Hoover shows that the producer's expected profits would be an important variable in his choice of location for his activity. "Each producer may be regarded as having in mind a maximum or "ceiling", rent that he could just afford to pay for the privilege of occupying any site. For better sites his ceiling is, of course, higher. If the pattern of actual rents asked happened to coincide with his pattern of ceiling rents, all locations would be equally desirable for him. In practice, however, he finds that in many locations the rent asked is more than he could afford, while if he is fortunate, there may be a few locations where he is asked less than his ceiling and therefore can make an extra profit" (page 90).

Using these ideas of land use competition (based upon "rent"), which in turn is influenced by transfer costs—a manifestation of the "friction" of distance resulting in systematic spatial patterns can be deduced for both urban and rural land use.

SUGGESTED EXERCISES, ASSIGNMENTS, AND DATA SOURCES

The cartographic examination of the volume and direction of overseas travel is another way of stressing the spatial factor in interaction. Exercises can be patterned after:

Mayfield, Robert C. "Goods, Men and Ideas—an Approach to a Problem," Journal of Geography, LX (May, 1961), 218-221.

Winsberg, Morton P. "Overseas Travel by American Civilians Since World War II," Journal of Geography, LXV, (February, 1966), 73-79.

Exercise on Flow Line Diagram—Overseas Travel:

Data:
- Survey of Current Business
- Survey of International Travel, U.S. Dept. of Commerce, Bureau of Foreign Commerce, Washington, D.C., 1956.
- Summary of Passport Statistics, U.S. Dept. of State, Passport Office, Washington, D.C.
- Annual Report—U.S. Dept. of Justice, Immigration-Naturalization Service, Washington, D.C.

Spatial Interaction, Gravity, and Potential Models

This is an appropriate place to discuss:

--the use of models in Geography and other Social Sciences.

--the use of mathematics/statistics in Geography and other Social Sciences.

Types of models are given treatment in:

Ackoff, R.L., et al. Scientific Method. New York: Wiley, 1962.

Iconic Models:

a. Look like what they represent.
b. Are really scaled representations of objects.
c. Examples: maps, aerial photos, floor plans, flow charts.

Analogue Models:

a. One property used to represent another.
b. Examples:
   --Closely spaced contours to represent steep slopes.
   --Different colors to show road types on maps.
   --Slide rule, where distances are used to represent quantities.
   --Graphs in which costs, numbers of people are plotted.

Symbolic Models:

a. Properties are expressed symbolically
b. Examples:
   --an equation

Generally Iconic and Analogue models are used as a preliminary to the construction of a Symbolic model.

The advantages and disadvantages of using Symbolic (mathematical) models are given treatment in:

Nagel, E. The Structure of Science. New York: Harcourt, Brace, 1961.

Wilson, E.B. An Introduction to Scientific Research. New York: McGraw-Hill, 1952.

Woolf, H. Quantification. Indianapolis: Bobbs-Merrill, 1961.

Specific overall discussion is also found in:

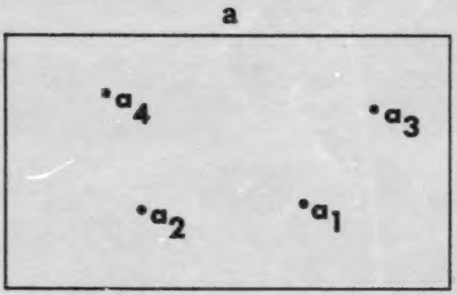
National Academy of Science/National Research Council. The Science of Geography. Report of the Ad Hoc Committee on Geography, Earth Sciences Division, Publication No. 1277, 1965.

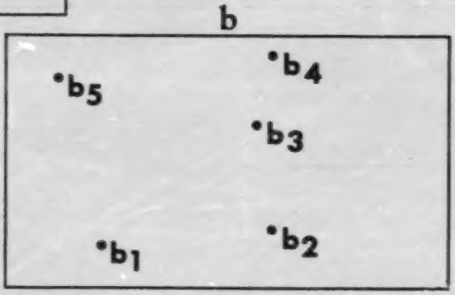
Explanation of the gravity and potential models of interaction could be approached this way:

Following Coleman, make the following assumptions:

(1) All pairs of persons a given distance apart have the same likelihood of interacting, exchanging transactions, in a given time interval.

(2) Given equal population densities, a person is more likely to have a greater exchange with persons nearer to him than with those at a distance.





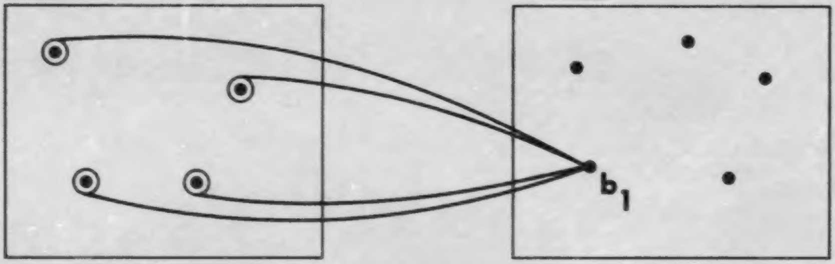
Using assumption (1)
Given two towns, $p_a = 4$

$p_b = 5$

Where p_a = population of town a

Where p_b = population of town b

Then a person in town b (say b_1) has p_a potential pair relations with persons in town a.



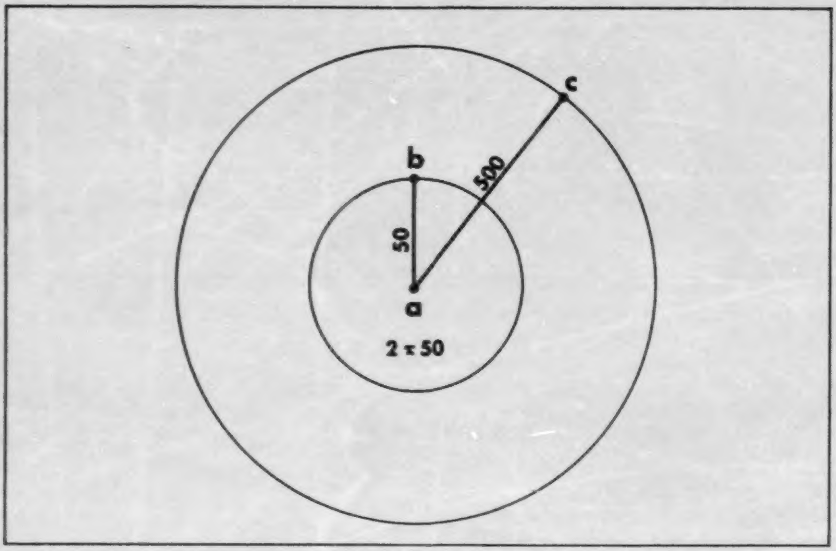
But there are p_b persons in town b, so that the total number of pairs is $p_a p_b$—that is the product of the populations of both towns. (The truth of this can be demonstrated by a numerical example)

Using assumption (2)

Given two towns b and c; b is 50 miles from town a, and c is 500 miles from town a. The circle with b as radius, and that with c demonstrates that, on the average, there are 10 times as many persons and towns in the larger circle.

Town a is likely to have more interaction with a particular town in the smaller circle (assuming that all the towns are of the same size) than with a town in the larger circle. The number of interactions would be inversely proportional to the distance.

The joint consequences of these assumptions is the well-known "Social Gravity Concept": The amount of interaction between two cities is directly



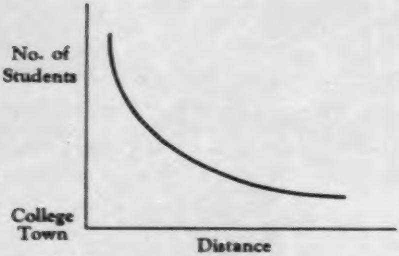
proportional to the number of people living in those cities, and inversely proportional to the intervening distance.

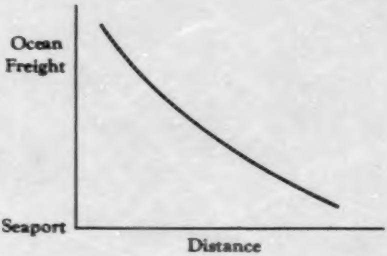
The empirical basis of this concept can be emphasized by tracing its development in the work of J.Q. Stewart, particularly:

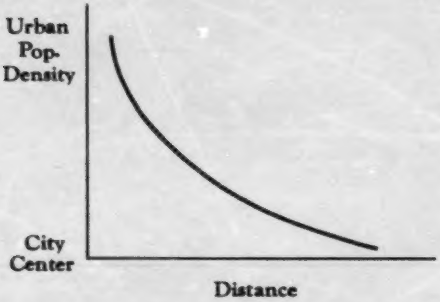
Stewart, J.Q. "An Inverse Distance Variation for Certain Social Influences," Science, XCIII (January 24, 1941), 89-90.

_________. "A Measure of the Influence of Population at Distance" Sociometry, V (March, 1942), 63-71.

Illustrations:







The concept of Population Potential is best developed in the work of William Warntz. Source material can be found in his:

"A New Map of the Surface of Population Potentials for the United States, 1960," Geographical Review, LIV (April, 1964), 170-184.

Macrogeography and Income Fronts
Regional Science Research Institute
Monograph Series, Number Three, 1965.

The Review paper is specially relevant.
"Potential of population - a macrogeographic, spatially continuous phenomenon - defines a 'demographic gravitational field' that is a useful concept for the understanding of certain features of the geographical patterns of economic and sociological activities" (Warntz)

Computation of a Potential Map

The large number of computations needed for the production of a potential map of the U.S.A. makes the use of a high speed computer necessary. Since this is not feasible for undergraduate classes, it is suggested that verbal (and perhaps symbolic) methods be given:
STEP 1 Compute interaction between city i and city j.
STEP 2 Do this for city i and all other cities.
STEP 3 Sum all these values, and this gives the population potential for place i.
STEP 4 Do this for all N places.
STEP 5 Draw isopleths.

EXERCISE: APPLICATION OF 'GRAVITY MODEL'

Exercises on the spatial factor in interaction are easy to construct if data are handy, especially data on flows or movement of people and goods.

One source of data obtainable on every campus is the number of students from each state. The population of each state can be secured from the appropriate Census Reports, while distances (airline) can be taken from any map, measuring from physical center to center.

Obviously there are many factors influencing the number of students that come from out of state. Higher fees may repel them; well-known departments may attract them. In this exercise we are interested in the factors associated with the "gravity models"—population and distance.

Knowledge of the process of interaction leads us to advance two hypotheses:

(1) Variations in the number of students at College X from different states will be directly related to the population of those states (i.e., the "mass" concept), and

(2) Variations in the number of students at College X from different states will be inversely related to the distance of the states from the state in which the College is situated ("the friction of distance").

These hypotheses have been combined to a simple interactance model of the gravity type and expressed symbolically as:

$$N_s = P_j^e / D_{ij}$$

where N_s an index representing the number of students from out of state
P_j^e the population of that state raised to some power - a constant.
D_{ij} the distance between that state and the state of College X.

Using this formula an index can be computed for each state and this hypothesized figure compared with the actual. This comparison can take several forms:

(1) Making a scatter diagram (scattergram), with the actual values on the vertical axis, and the deduced on the horizontal.

(2) Visual examination of the figures, and deviations noted. Attempts can be made to account for these deviations.

(3) Choropleth maps can be made for the two groups of figures, using narrow categories - the same categories for each map - and the results again compared visually.

(4) A simple co-efficient of correlation can be computed between the observed number of students and the hypothesized.

(5) (Optional) One of the non-parametric tests (as described in Siegel[7] can be used to see if the observed and the computed are significantly different.

Spatial interaction and Diffusion

This topic provides an opportunity to introduce stimulating material from neighboring disciplines which have an interest in the diffusion process - for example, Cultural Anthropology. The available source materials provide many (interest-creating) illustrations and opportunities for map exercises. However, the focus should be on the spatial factor in the spread of innovation - thus highlighting the geographer's contribution to the understanding of the rate and direction of the spread of ideas, artifacts, techniques, etc.

A relevant bibliography is:

Brown, L. A Bibliography on Spatial Diffusion. Discussion Paper No. 5, Department of Geography, Evanston: Northwestern University Press, June, 1965.

Source material can be found in:

Hagerstrand, T. The Propagation of Innovation Waves. Lund. Lund Studies in Geography, Series B, (4, 1952), 3-19.

Katz, E., et al. "Traditions of Social Research on the Diffusion of Innovation," American Sociological Review, XXVIII (April, 1963), 237-252.

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[7] Sidney Siegel, Non-Parametric Statistics (New York: McGraw-Hill, 1956).

UNIVERSITY OF IOWA
GEOGRAPHICAL DISTRIBUTION OF STUDENTS
(By State)

	State	Distance	Total Students	Population	P_i/D_{ij}	Deviation
	1. Alabama	759	15	3,317,000		
	2. Arizona	1578	16	1,486,000		
	3. Arkansas	766	21	1,842,000		
	4. California	2074	118	17,029,000		
	5. Colorado	703	32	1,893,000		
	6. Connecticut	1236	31	2,625,000		
	7. Delaware	1094	4	467,000		
	8. Florida	1181	40	5,434,000		
	9. Georgia	832	12	4,083,000		
	10. Idaho	1491	8	700,000		
Point	11. Illinois	258	1272	10,098,000		
of	12. Indiana	422	53	4,663,000		
Origin	13. Iowa		8509	2,774,000		
	14. Kansas	483	70	2,215,000		
	15. Kentucky	504	9	3,084,000		
	16. Louisiana	1039	10	3,371,000		
	17. Maine	1746	9	978,000		
	18. Maryland	1034	23	3,233,000		
	19. Massachusetts	1256	55	5,188,000		
	20. Michigan	510	122	8,029,000		
	21. Minnesota	411	142	3,461,000		
	22. Mississippi	841	11	2,261,000		
	23. Missouri	221	96	4,316,000		
	24. Montana	1161	17	697,000		
	25. Nebraska	265	98	1,446,000		
	26. Nevada	1422	4	350,000		
	27. New Hampshire	1679	10	622,000		
	28. New Jersey	1080	103	6,357,000		
	29. New Mexico	1128	12	997,000		
	30. New York	1146	216	17,498,000		
	31. North Carolina	910	13	4,704,000		
	32. North Dakota	621	30	633,000		
	33. Ohio	519	88	10,038,000		
	34. Oklahoma	565	17	2,448,000		
	35. Oregon	2038	16	1,807,000		
	36. Pennsylvania	1054	86	11,382,000		
	37. Rhode Island	1100	5	878,000		
	38. South Carolina	1053	4	2,448,000		
	39. South Dakota	535	76	721,000		
	40. Tennessee	760	27	3,642,000		
	41. Texas	780	60	10,122,000		
	42. Utah	1291	14	958,000		
	43. Vermont	1626	2	387,000		
	44. Virginia	1100	26	4,248,000		
	45. West Virginia	1002	13	3,090,000		
	46. Washington	2044	20	1,796,000		
	47. Wisconsin	342	111	4,019,000		
	48. Wyoming	772	6	332,000		

(Data: SUI Admissions)

Note: Suggested Exponent for the population in this case is .003.

Kirk, W. "The Primary Agricultural Colonization of Scotland," *Scottish Geographical Magazine*, LXXIII (September, 1957), 65-90.

Morrill, R. "The Distribution of Migration Distances," *Papers and Proceedings of the Regional Science Association*, XI (1963), 75-84.

Rogers, E.M. *Diffusion of Innovations*. New York: The Free Press of Glencoe, 1962.

Sauer, Carl O. *Agricultural Origins and Dispersals*. New York: American Geographical Society, 1952.

Wagner, R.L., and Mikesell, M.V. (eds.). *Readings in Cultural Geography*. Chicago: University of Chicago Press, 1962.

Many disciplines are interested in the diffusion process. There have been many approaches to examination of the mechanics of the process, and a large literature. As Katz, *et al*, have said:

> "...it almost seems as if diffusion research in the various research traditions can be said to have been 'independently invented!' Indeed, diffusion researchers in the several traditions...scarcely know of each other's existence.... As a result, each tradition has emphasized rather different variables and a characteristically different approach."[8]

The keynote to a geographer's approach is sounded by Morrill in the work suggested above.

> "We recognize the fact that from any source of movement or migration a kind of diffusion occurs in which the frequency or probability of migration is related to distance."[9]

It is suggested that the interaction aspect be stressed by starting with some 'real world' examples from Sauer, for example, and then proceed to more abstract considerations as in Morrill, Pitts, Hagerstrand and Bowden.

Bowden, L. *The Diffusion of the Decision to Irrigate*. University of Chicago, Department of Geography, Research Paper No. 97. Chicago: 1965.

The hierarchiacal nature of the spatial aspects of diffusion should be emphasized. For example, ideas seem to spread from central place to central place by a "leap-frog" process, and then outwards from these centers to neighboring smaller centers following a "density-decline" function. (A tie-in can be made with the Unit on Surfaces.)

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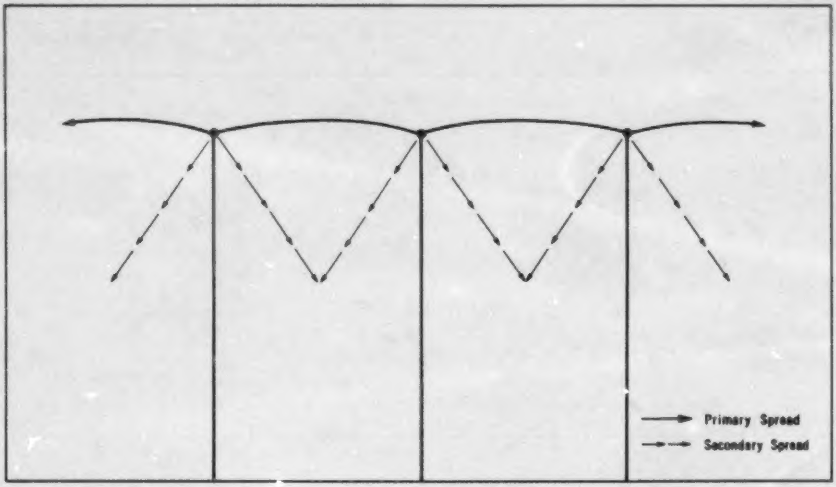
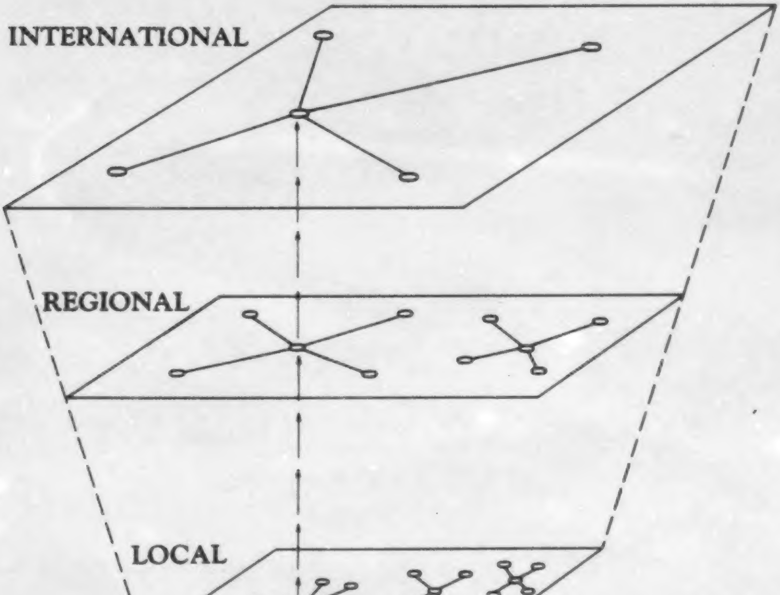
[8] E. Katz, et al. "Traditions of Social Research on the Diffusion of Innovation," *American Sociological Review*, XXVIII (April, 1963), p. 240.

[9] R. Morrill, "The Distribution of Migration Distrances," *Papers and Proceedings of the Regional Science Association*, XI (1963), p. 75.


Primary Spread
Secondary Spread

Hagerstrand also postulates this hierarchical idea, operating on the local plane, the 'regional' plane and the international plane.

HIERARCHY OF THE DIFFUSION PROCESS
(slightly modified from Hagerstrand)


INTERNATIONAL
REGIONAL
LOCAL

Preliminary Remarks: Spatial Interaction and Central Place Theory

A sizeable literature has grown up around Central Place Theory. See for example:

Berry, B.J.L., and Pred, A. Central Place Studies. A bibliography of theory and applications. Philadelphia: Regional Science Research Institute, 1965.

There have been several approaches. The aim here should be to view the central place pattern as a result of the spatial factor in interaction.

The following provide background material for this approach:

Haggett, P. Locational Analysis in Human Geography. London: Arnold, 1965.
Losch, A. The Economics of Location. New Haven, Connecticut: Yale University Press, 1954.
Meier, R. A Communication Theory of Urban Growth. Cambridge, Massachusetts: Massachusetts Institute of Technology Press, 1962.
Ullman, E.L. "A Theory of Location for Cities," American Journal of Sociology, XLVI (May, 1941), 853-864.
Webber, M. Explorations into Urban Structure. Philadelphia: University of Pennsylvania Press, 1963.

Material should be chosen to demonstrate the general theme of the unit. Meier, for example, after examining human settlements in their historical development, and after considering the 'behavioral' aspects of city life, concludes that interaction was the thread running through the genesis and development of all cities. This is so whether we view interaction in terms of concrete market place transactions or in the more abstract notion of cultural contact and transmission.

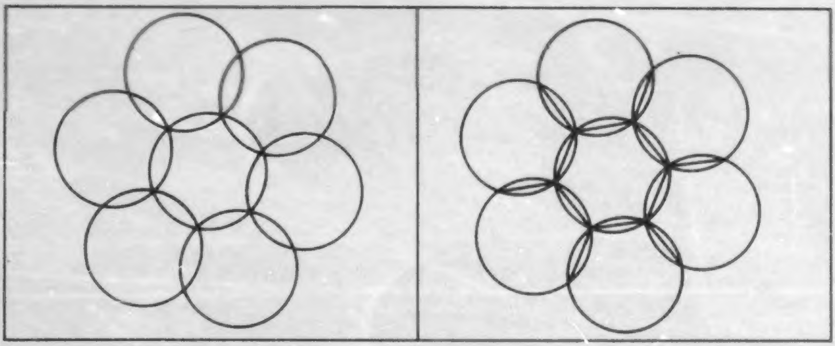
Webber stresses the importance of viewing a system of cities as a "dynamic system in action." This dynamic system sets up linkages - either visible (roads) or invisible (radio waves) - interconnecting the parts of the system in a hierarchical manner. His view of linkages involves three related perspectives:

--the spatial aspect of interaction
--the physical form of the city - transportation networks and other functional units
--the system as a result of activity - the spatial distribution of various types of functions of either an economic or socio-political nature.

It is suggested that these ideas be stressed before the assumptions, configurations and other aspects of Christaller.

Preliminary ideas to be developed:

The substantive part of Christaller's ideas can be approached deductively: Perhaps a small "experiment" can be conducted: arrange five pennies on a square so that no area of the square (the plain) is left 'unserved'. It can be demonstrated that geometric laws determine what would seem to be the most 'efficient' arrangement of the coins (service centers). The experiment can be conducted for 6 coins (no solution?), and 7 coins.



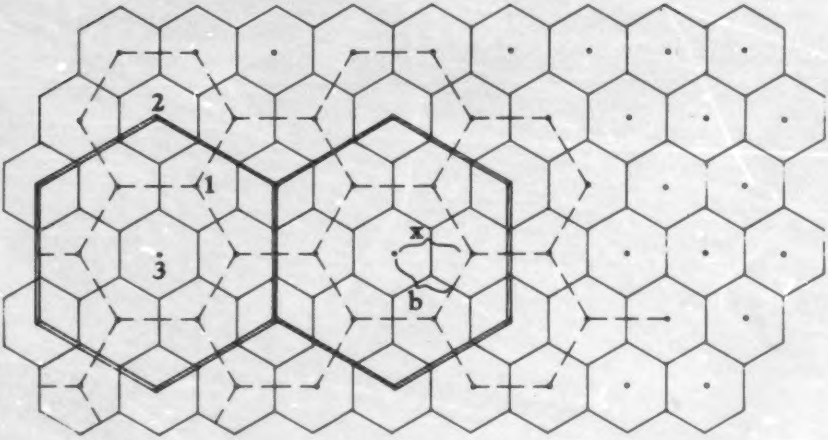
Each service center would have a circular trade area (Why?). These would be overlapping; lines can be drawn to divide the overlapping area equally between neighboring centers. Hexagons should fill the area with no overlap. One of the clearest treatments of one aspect of Christaller is:

Getis, Arthur and Judith. "Christaller's Central Place Theory," Journal of Geography, LXV (May, 1966), 220-226.

Their explanation and definition of:
A Central Place; Range of a Good; The Complementary Region; and The K-3 Network,
can be neatly tied in with the discussion of the spatial factor in interaction.

Class exercises are not easy to construct especially if there is a desire to use "real world data". But, by using ruled paper, exercises can be made up to reproduce the theoretical hexagon arrangement of trade areas, and also the hierarchical nature of each type of network.

CHRISTALLER'S K-3 NETWORK



CHRISTALLER'S $\left.\begin{matrix}\text{K-3}\\ \text{K-4}\\ \text{K-7}\end{matrix}\right\}$ **NETWORK**

---Means that the number of equal-size cities in lower size classes increases regularly 3, 4, or 7 times.

Explanation for K-3 Network

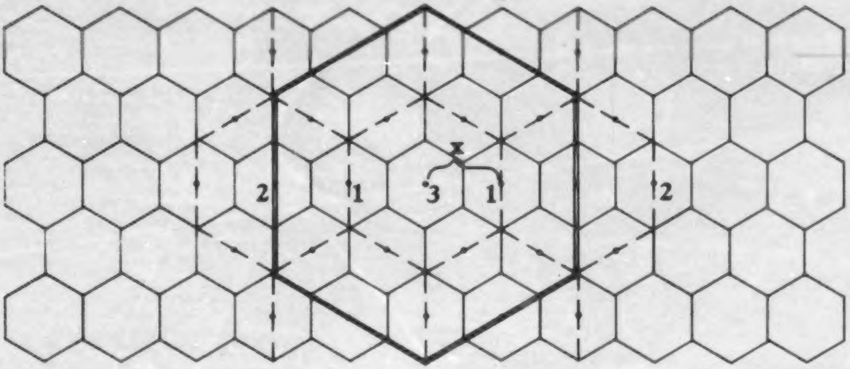
Trade area of lowest order central place	——— ———
Trade area of second order central place	- - - - - - - - - -
Trade area of third order central place	═════════

The K-3 network is based on the marketing or supply principle wherein all areas are served by a minimum number of places of larger order. Relationships between towns of succeeding order follow the rule of 3's.

Distance between towns increases by 3	Area of trade territory increases by 3
$\frac{X}{2}$ = basic distance	A = area of lowest order town
X = distance between towns of lowest order	$A + \frac{6A}{3}$ = area of next order town
$b = \sqrt{X^2 - \frac{X^2}{4}}$	3A = area of next order town
$b = \sqrt{\frac{3X^2}{4}}$	
$b = \frac{X}{2}\sqrt{3}$ $\quad 2b = X\sqrt{3}$	

2b = distance between town of second order

CHRISTALLER'S K-4 NETWORK



Trade area of lowest order central place ————————
Trade area of second order central place – – – – – – – – –
Trade area of third order central place ════════

The K-4 network is based on the transportation principle and relationships between towns of succeeding orders follow the rule of 4's.

In this network, a single straight line (transport route) between larger centers connects a maximum number of important places of lower order.

Distances between towns increases by 4	Area of trade territory increases by 4
$\frac{X}{2}$ = basic distance (minimum travel)	**A = area of lowest order town**
X = distance between towns of lowest order	**$A+\frac{6A}{2}$ = area of second order town**
X(2) or X 4 = distance between towns of second order	**4A = area of second order town**

CHRISTALLER'S K-7 NETWORK

The K-7 network is based on the administrative principle in which each successively higher place exercises control over 6 complete towns of the next lower order.

Area of trade territory increases by 7

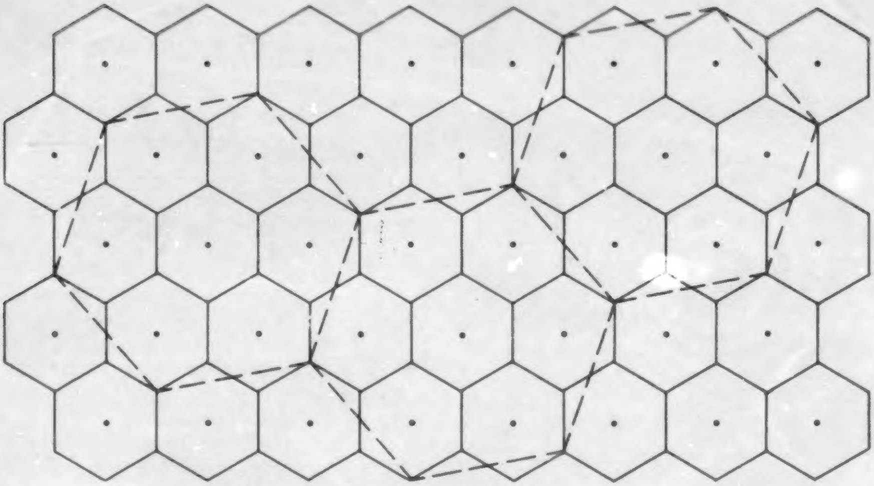
A = area of smallest order place

$A+\frac{5}{6}$ of $6A+\frac{1}{6}$ of $6A = 1+5+1=7$

7A = area of next order place

Christaller's K-7 Network diagram shown on the next page.

CHRISTALLER'S K-7 NETWORK



Trade area of lowest order central place ————————
Trade area of second order central place - - - - - - - - - - -

Spatial Interaction, Gravity and Potential Models—Continued:

The literature built up around these 'models" is quite large. Preparation for this part of the Unit on Interaction consists mainly in choosing appropriate material from the following:

Carrothers, G.A.P. "An Historical Review of the Gravity and Potential Concepts of Human Interaction," Journal of the American Institute of Planners, XXII (1956), 94-102.

Olsson, G. Distance and Human Interaction. Regional Science Research Institute Bibliography Series No. 2, 1965.

A critique of these "models" has been given by David Bramhall, Methods of Regional Analysis. (by W. Isard, et al.) New York: Wiley, 1960.

For a more recent critique see James S. Coleman. Introduction to Mathematical Sociology. New York: Free Press, 1964, 470-478.

Spatial Interaction and Land Use

The physical separation of various types of land use within an urban area is another suggested vehicle for explaining movement over area—the volume, direction and intensity of interaction. This vehicle can be tied in with considerations of the spatial structure of cities, as well as with the location, distribution and density of linkages.

The following provide source material:

Hoover, E.M., and Vernon, R. Anatomy of a Metropolis. Cambridge: Harvard University Press, 1959.

Loewenstein, L.K. The Locations of Residences and Work Places in Urban Areas. New York: Scarecrow Press, Inc., 1965.

Mitchell, R.B., and Rapkin, C. Urban Traffic: A Function of Land Use. New York: Columbia University Press, 1954.

Oi, W., and Shuldiner, P. An Analysis of Urban Travel Demands. Evanston: Northwestern University Press, 1962.

Taaffe, E., et al. The Peripheral Journey to Work: A Geographic Consideration. Evanston: Northwestern University Press, 1963.

Data also exist for the construction of meaningful exercises. For example, in: The Chicago Area Transportation Study (C.A.T.S.). The "urban land use theory" stressed in the unit on "Surfaces" can provide a relevant starting point for the discussion.

The points to be covered are:

A. Why this topic is of interest to geographers.
B. Factors contributing to the spatial variation of travel patterns.
C. Non-residential trips, stressing the interaction patterns set up by the physical separation of living areas on the one hand and business/place of work on the other.
D. The distribution of "labor sheds".
E. The relative importance of the different modes of transport.
F. The role of labor force differences upon the intensity of interaction. Difference like sex, occupation, age, and composition.....
G. The "friction of distance".

OUTLINE

For an Introductory College Geography Course Titled

INTRODUCTION TO THE STUDY OF GEOGRAPHY

Wesley C. Calef
University of Chicago

Introduction

At the outset it is important to state explicitly that the outline presented below is suggested, not recommended. The author now has twice taught an "experimental" course based on an original, inductively created outline sharply different from the one here displayed. Subjected to the test of classroom use, parts of the original outline proved illogical, trivial, or uninteresting—or all three. Other sections of the original outline proved more stimulating and significant than anticipated. Many defects of organization and content quickly became obvious, and new materials and organizational structures were substituted. I here publicly commiserate with and apologize to the victimized students who struggled hopelessly to impute some logical organization or structure to a course that, as it was presented, had none.

On the basis of the initial classroom experience the course outline was revised; new concepts, new data, and new organization were substituted for the discarded, unsatisfactory segments of the original outline. Using the new outline the course was offered again with similar results. The revised course exhibited structural defects and pedagogical deficiencies; although the inadequacies of the second outline were neither so extensive nor so fundamental as were those of the initial attempts. On the basis of the second experimental teaching experience the outline for the course was revised again. This second revision is presented below. How satisfactory the current outline will prove in the classroom cannot be determined a priori. The author will use it for an introductory class again, and will revise it on the basis of that experience. The reader is invited to utilize the outline (or those parts that he finds promising) in the same way.

Rationale of the Outline

This course outline is based on three initial assumptions:

(1) at the beginning of the course the students will have almost no knowledge either factual or conceptual about the geography of the world;
(2) the data of geography are sufficiently numerous to make an attempt at general coverage an exercise in futility;
(3) the outlined course will be the student's only college course in geography.

All three of the initial assumptions seem realistic. First, nearly all students enrolling in introductory geography courses have no significant knowledge of geographical data, of geographic literary or visual materials, or of geographical methods. Second, to quote Philip Wagner: "Among all the branches of human knowledge, that which is called geography contains the largest single body of factual information"—a statement in which most geographers would concur, at least in a less extreme form. Third, the overwhelming majority of registrants in introductory geography courses never take another course, or at most take an additional one or two geographic courses.

If these three assumptions are realistic and reasonable they carry some strong implications for the characteristics of an introductory college course in geography, and these implications have served as directives in the construction of the successive outlines for the course.

The implications of the third assumption—that this is the students' only college course in geography—were the ruling consideration in constructing the entire course. The most important implication was that the student should be taught those most significant and important facts about the world that geography is capable of elucidating. This conclusion affords some guidance for the inclusion or omission of materials and ideas in the course. Only the more important geographical findings are retained. Nothing is held back or reserved for subsequent courses. This conclusion should not be evaluated as simply a tiresome reiteration of an obvious truism. If the reader will review those introductory courses with which he is acquainted, he will realize that their content is related, both positively and negatively, to other geography courses offered in the same department; that is, materials are included in the introductory course as preparation for studying subsequent geography courses, or—of greater consequence—important data and concepts are omitted from the introductory course because they are "covered" more thoroughly and in greater detail in other more specialized courses. The course outlined below specifically and affirmatively eschews that approach: selection of materials for inclusion is solely on the basis of significance to geographic understanding.

The assumption that the introductory geography course will be both the students' first and last formal course in geography points to another interrelated set of implications. The geographer hopes that his students, for the rest of their lives, will retain an awareness of the significance of local and world-wide geography, will view the world and the people on it in the perspective that geographers maintain, will understand the significance of and be concerned with those problems that geographers regard as important, and will be able to use geographical concepts, modes of analysis, and research techniques in studying the world and its problems; in short, he wants them to develop an interest in geographical matters and the ability to comprehend geographical data. Consistent with our assumption that the introductory course is our only classroom access to the student, our primary purpose must be to prepare the student for a lifetime of geographic self instruction, not for subsequent formal classroom instruction. The introductory course is our single opportunity to instill the motivation and to supply the analytical tools to nourish that lifetime of self instruction.

The first of our ruling assumptions—that the students enter the class innocent of geographical data and concepts—carries the obvious, but important, implication that the course itself must supply any geographical data, techniques, or concepts that the student will need, either immediately in the course or in the indefinite future. The course must begin at the beginning and explicitly tutor on every item that the instructor wants the student to acquire.

This objective raises a delicate, rather than difficult, pedagogical problem. Numerous rather simple and uncomplex definitions, concepts, and techniques must be introduced and explained to the students or practiced by them. They must be explained sufficiently so that they will be understood; but overexplanation or tiresome repetitive practice of a technique are among the surest ways to kill interest in and respect for the subject.

The course for which the outline has been used comprises a third of the students' work for two quarters: it is the equivalent of approximately seven semester hours. Because the course as outlined is not tightly integrated and structured, to expand the course to an academic year or to contract it to a semester would not be difficult. Hence, time allocations have been expressed as proportions of total course time instead of in absolute time units such as days, hours, or weeks.

The outline is presented separately immediately below, followed by the commentary on the outline—an arrangement that enables the reader to obtain the most compact view of the outline's structure, proportions, and sequence.

OUTLINE

INTRODUCTION TO THE STUDY OF GEOGRAPHY

I. The Idea of Human Organization and Use (Occupance) of Area 10%
- A. Indian occupance of an area of the U.S.
  - Major aspects of occupance—relations to ideas of animal ecology
    - Population density and structure
    - Natural environment
    - Culture
      - Social organization
      - Pattern of settlement
      - Modes of economic activity
        - Technology—modes of resource use
    - External relations
- B. Current Occupance of the Same Area
  - Present characteristics of the same aspects of occupance
- C. People's organization and use of area as a system
  - The idea of a system
  - Characteristics of an occupance system, illustrated by the two examples previously described

II. Maps: Their Characteristics and Uses 5%
- A. The general problem of accurately describing the spatial arrangement of things on the globe.
- B. Matters of scale
- C. The geometrical characteristics of the globe grid
- D. Map projections: methods of depicting the globe grid in two dimensions.
  - Analysis of global and hemispherical maps—population, cities, mountains, nations, climate, etc.
- E. Maps as depictions of statistical surfaces
- F. Large scale maps

III. The Natural Enrivonment of the Human Race 15%
- A. The segments of the natural environment and their interaction
  - The lithosphere, atmosphere, hydrosphere, and biosphere
- B. Atmosphere and Hydrosphere
  - Characteristics and physical behavior of atmosphere and hydrosphere
  - Flux of energy and moisture near the earth's surface
  - Resultant world distribution of climates
- C. Lithosphere
  - Composition and structure

    - Vulcanism and diastrophism
    - Interaction with atmosphere and hydrosphere
        - Weathering and erosion
        - Soil formation
            - Spatial relations to climatic regions
- D. Biosphere
    - Components of Biosphere and major ecological processes
    - Relations to atmosphere, hydrosphere, and lithosphere
    - Relations with man

IV. Political Organization of People and Area 15%
- A. General nature of political organization
    - Current dominance of the sovereign state
        - Super state political organizations
        - Intra-state political organization
- B. Principal characteristics of the state
    - Population, types of Internal organization, area, boundaries, resources, external relations
- C. World political-geographic organization
    - Classification and description of sovereign states
        - By principal characteristics listed under B above
    - Super state organizations

V. Economic Organization of People, Areas, and Resources 15%
- A. Economic Geography as an Aspect of Human Ecology
- B. Relationships between Production, Consumption, and Exchange of Commodities
    - The range of area scale and degrees of complexity of exchange
- C. Some very simple economic-geographic organizations
    - Gathering, herding, and peasant cultivation
- D. Technologically sophisticated, elaborate exchange economies
    - Centrally managed production, distribution, and consumption
        - Communist dominated world
    - Market oriented production, distribution, and consumption
        - Western Europe and North America
- E. Interpenetration of the various forms of economic organization
- F. Inter-relations among economic organization, political organization, technological development, and natural resources

VI. Regional Analysis
- A. Arctic Region 5%
- B. Anglo-America and the Economically Developed World 15%
    - The economically and technologically developed world discussed in the same aspects as were the societies in Section I of this outline
- C. The Underdeveloped World 15%
    - The underdeveloped world discussed in the same aspects as in the immediately preceding section.

VII. Relations Between the Developed and the Underdeveloped World 5%

Relations in terms of cultural, habitat, economic, and political aspects.

Commentary

Section I treats the organizing ideas of the entire course, but it does so by considering substantive facts concerning the contrasting ways in which two groups of people have organized and used the same area at different times. The two groups described are a tribe of American Indians prior to contact with Europeans and the current population of European extraction occupying the same section of the United States. Class time is devoted to a consecutive and explicit development of the idea that we are concerned with a population organizing the contents of the earth space they occupy and developing a technique for living in the area. Parallels with animal ecology are developed—the necessity for a continuous supply of food and water, of shelter, arrangements for defense against enemies, provision for the nurture of the young, allocation of space, distribution of goods, and the division of labor. It is repeatedly stressed that these aspects of human ecology—population numbers and structure, characteristics of the natural environment, elements of the culture such as social organization and level of technology—are universals, true for all peoples living in any area.

A second theme that runs through all of Section I is the idea of an ecological system, stressing the coherence of the system, the structural interrelations of all components of the system, and the pervasive influence of the group's culture.

Few comments are required on Section II – Maps. Most students who register for an introductory course in college geography are favorably predisposed toward maps. When presented zestfully, the section on maps evokes a strongly affirmative student response. Class discussion is particularly effective in this section. In my classes each student has an eight-inch globe in his hand during the discussions of the global grid, map projections, and maps of world distributions. Projections are studied analytically, and questions from the instructor about the properties of the various projections commonly elicit highly self-instructive class discussions. The sections on larger scale maps are designed to acquaint students with the capabilities and limitations of maps of various scales, techniques, and designs. Lastly, the study of global and hemispheric maps of various kinds can serve as an effective device to introduce a number of major distributions (population, terrain, etc.) which will serve as background information and reference materials for all subsequent sections of the course.

Section III – The Natural Environment probably requires the least comment because the data have customarily been included in introductory college geography materials. The extreme limitations of time have two moulding influences on the structuring of this section. Our objective is to provide the student with a few crucial organizing and analytical ideas to be used for extensive subsequent reading about the human natural habitat. The world's climatic characteristics are treated entirely as innumerable local variations of the flux of energy through the atmosphere and hydrosphere, understanding of which requires a few extremely simple and basic ideas about the physical behavior of gases and liquids. The composition and form of the surface of the lithosphere are treated, in traditional fashion, as a resultant of the interaction of internal earth forces (diastrophism, volcanism, isostasy) and external forces (weathering and erosion). The resultant physical geographic patterns are sketched only in the broadest and most simplified global provinces, and the significance of their relations to human affairs is stressed. Bio-geography, because of its complexity, is treated almost entirely descriptively. Its susceptibility to human modification is emphasized.

Political geography, Section IV, is allocated much more time and attention in this outlined course than in other introductory courses with which I am acquainted, with one or two possible exceptions. This structuring seems clearly justified, however, by the current forms of human interaction and organization over the surface of the globe. Inter-national relations between peoples over most of the earth are regulated, characterized, and controlled by the sovereign political states. Likewise, many of the more important and significant intra-national aspects of life are also shaped, directed, and modified by the structure and functions of the sovereign state. Moreover, nearly all information we receive about society, resources, and human activities from all parts of the globe is classified and organized for us in terms of national states or parts of national states. To me it seems crucial to acquaint the citizen with an understanding of the identifying characteristics of sovereign states and with the current political geographic structure of the earth. One principal objective perhaps not directly suggested by the outline is to relate the world political map to the natural habitat description developed in the previous section.

The significant relationships between the state and its component population are analyzed and then surveyed for a major fraction of the world's states. A vital difference between the political organization of very simple societies and of large complex states is developed. In a simple society the structure of the religious, military, economic, and political organizations may be almost identical; whereas in complex intricately organized, modern states there may be very little overlap of personnel among the various functional organizations of the state. The national states are surveyed and classified with respect to these characteristics. The same relationships are also demonstrated to be of significance to the internal structure of states.

Time permits only a cursory consideration of super-national political organizations and arrangements.

Of the entire outlined course, Section V - Economic Geography has proved least efficient in the classroom, most refractory to reorganize, and is the section in which currently I have the least confidence. The difficulties arise from the multiplicity of interrelationships that exist between the economy and the natural environment, political and social organization, level of technology, and the history of the people and area. So numerous are the complexities and the truly vital aspects of economic organization that it has proved difficult to devise an organizational scheme neatly to mesh and articulate them.

A review of Section V of the outline indicates that so much of the available time is devoted to consideration of a few major ideas about economic organization and relationships that little time is left to survey world patterns of production and exchange. Nevertheless, the approach indicated by the outline seems much preferable to stuffing the student with a mass of economic geographic facts without providing him with some organizing ideas with which to render the facts coherent and reasonable.

The latter 40% of the course has twin objectives: (1) to give the student some experience with comprehensive regional analyses, and thereby acquaint him with the regional approach and perspective; and (2) to integrate, exemplify, and review the systematic geographic facts that have been the major focus of attention in much of the first half of the course. Because of the inadequate treatment of economic geography in Section V, the regional analysis has been formulated and organized with a strongly economic orientation.

The outline makes clear that the regional section does not contemplate an orderly, comprehensive coverage of a world system of regions. Quite to the contrary, regions of greatly different scale, basis of definition, and general characteristics are studied, and constant attention and emphasis are paid to the way in which, as the outline states, the various aspects of human organization and use of area are integrated into the regional occupance system.

The regional segment of the course opens with a consideration of the Arctic, because the harsh environment, the low population density, the simplicity of the economic and political aspects, and most particularly because the extreme economic contrast in the life mode and conditions of populations based upon subsistence exploitation of local resources and of those based upon external resources make the region especially suitable as an introduction to the kinds of analysis to be followed in the remainder of the course.

Thereafter the instructor has a wide latitude of regional choice. A consideration of the occupance pattern of Arctic America can lead, through a study of spatial interaction, to a consideration of the regional geography of Anglo-America. The regional geography of the continent may be taught by asking the students to contemplate the nature of regions and the process of regional differentiation and delimitation. Various kinds of regions within Anglo-America may be studied in turn. During my two experimental offerings of the course, the western range grazing region, the Great Valley of California, and the Chicago Region were studied. The first two regional choices did not prove unduly successful; the Chicago Region did. Which suggests that regional study of the local area, particularly if it is complex and diverse, may commonly prove of strong interest to introductory students.

The regional study of Anglo-America as an economically highly developed area is followed by a similar, brief, comparative analysis of Europe, during which similarities and contrasts between two economically developed areas are described and analyzed. Hopefully, this discussion leads to a clearer understanding of the meaning of economic development and underdevelopment. This is followed by an even briefer review of Australia and Japan as economically developed regions.

An essentially similar regional analysis and description of Africa as an economically underdeveloped region considers the same aspects of occupance. The choice of sub-regions for description and analysis is much more limited because of the paucity of detailed regional information easily available. To avoid tedious repetition we may summarize the treatment of the underdeveloped areas as being closely parallel to that for the developed regions.

The course closes with an overall comparative survey of the economically developed and underdeveloped areas of the earth: its purpose being to pull together and review the threads of geographic analysis that have constituted the fabric of the entire course.

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